45. 536.

A SYSTEM

OF

PRACTICAL ARITHMETIC;

CONTAINING

THOSE RULES ONLY WHICH ARE MOST USEFUL
IN ACTIVE LIFE:

WITH

NUMEROUS FORMS OF BILLS,

INVOICES, &c.

For the Use of Schools and Students in general.

BY

WILLIAM LANE,

WARWICK HALL, WORTHING.

LONDON :

RELFE AND FLETCHER, 17, CORNHILL.

1845.

PREFACE.

THE reason for publishing this work was to supply the deficiency of what the author felt to be necessary for the due improvement of his own pupils; and its direct object is to form the accomplished accountant and practical man of business.

It may be given with propriety either to young boys as a first book of arithmetic, to boys who are just leaving school, to prepare them for the practical calculations of active life, or to those whose education has been neglected, or whose time for study at school is but limited. The only requisite introduction to it is a thorough knowledge of the first four rules of arithmetic, both simple and compound, — especially compound long division, with the proof, — and it is strongly recommended, for several reasons, that these preparatory exercises should be set by the teacher on the pupil's slate, and when done, rubbed out. This work, with book-keeping by single and double entry, will be found amply sufficient for men of business in general; but to those students

who remain at school the usual time, " Keith's Arithmetic" should be given after this, with an occasional reference to this work, under the denomination of promiscuous ciphering, as it contains a greater number of examples, under the more important rules, than any other work of a similar nature.

A compendium of mental arithmetic has been prefixed to the work; and as classes for tables are usually formed in schools once or twice a week, mental arithmetic should be taught to the advanced classes at the same time. This entire plan, perseveringly pursued, has been attended with the most eminent success in the author's own experience.

WORTHING, *Jan.* 1*st*, 1845.

ARITHMETICAL TABLES.*

NUMERATION TABLE.

Units	1
Tens	21
Hundreds	321
Thousands	4,321
Tens of Thousands ··	54,321
Hundreds of Thousands..........	654,321
Millions	7,654,321
Tens of Millions	87,654,321
Hundreds of Millions	987,654,321

This table is indefinite in its extent; but what is here inserted is sufficient for every common purpose.

---

* These tables are arranged in the most convenient form for being committed to memory, and for repetition.

MULTIPLICATION TABLE.

Twice	3 times	4 times	5 times	6 times	7 times
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6	1 are 7
2 – 4	2 – 6	2 – 8	2 – 10	2 – 12	2 – 14
3 – 6	3 – 9	3 – 12	3 – 15	3 – 18	3 – 21
4 – 8	4 – 12	4 – 16	4 – 20	4 – 24	4 – 28
5 – 10	5 – 15	5 – 20	5 – 25	5 – 30	5 – 35
6 – 12	6 – 18	6 – 24	6 – 30	6 – 36	6 – 42
7 – 14	7 – 21	7 – 28	7 – 35	7 – 42	7 – 49
8 – 16	8 – 24	8 – 32	8 – 40	8 – 48	8 – 56
9 – 18	9 – 27	9 – 36	9 – 45	9 – 54	9 – 63
10 – 20	10 – 30	10 – 40	10 – 50	10 – 60	10 – 70
11 – 22	11 – 33	11 – 44	11 – 55	11 – 66	11 – 77
12 – 24	12 – 36	12 – 48	12 – 60	12 – 72	12 – 84

8 times	9 times	10 times	11 times	12 times
1 are 8	1 are 9	1 are 10	1 are 11	1 are 12
2 – 16	2 – 18	2 – 20	2 – 22	2 – 24
3 – 24	3 – 27	3 – 30	3 – 33	3 – 36
4 – 32	4 – 36	4 – 40	4 – 44	4 – 48
5 – 40	5 – 45	5 – 50	5 – 55	5 – 60
6 – 48	6 – 54	6 – 60	6 – 66	6 – 72
7 – 56	7 – 63	7 – 70	7 – 77	7 – 84
8 – 64	8 – 72	8 – 80	8 – 88	8 – 96
9 – 72	9 – 81	9 – 90	9 – 99	9 – 108
10 – 80	10 – 90	10 – 100	10 – 110	10 – 120
11 – 88	11 – 99	11 – 110	11 – 121	11 – 132
12 – 96	12 – 108	12 – 120	12 – 132	12 – 144

FARTHINGS TABLE.

far.	s.	d.	far.	s.	d.	far.	s.	d	far.	s.	d.
4	are 0	1	14	are 0	3½	24	are 0	6	48	are 1	0
5	– 0	1¼	15	– 0	3¾	26	– 0	6½	50	– 1	0½
6	– 0	1½	16	– 0	4	28	– 0	7	60	– 1	3
7	– 0	1¾	17	– 0	4¼	30	– 0	7½	70	– 1	5½
8	– 0	2	18	– 0	4½	32	– 0	8	80	– 1	8
9	– 0	2¼	19	– 0	4¾	34	– 0	8½	90	– 1	10½
10	– 0	2½	20	– 0	5	36	– 0	9	100	– 2	1
11	– 0	2¾	21	– 0	5¼	38	– 0	9½	200	– 4	2
12	– 0	3	22	– 0	5½	40	– 0	10	500	–10	5
13	– 0	3¼	23	– 0	5¾	44	– 0	11	1000	£1.0.10	

PENCE TABLE.

d.	s.	d.	d.	s.	d.	d.	£	s.	d.
12	are 1	0	108	are 9	0	230	are 0	19	2
20	— 1	8	110	— 9	2	240	— 1	0	0
24	— 2	0	120	— 10	0	300	— 1	5	0
30	— 2	6	130	— 10	10	400	— 1	13	4
36	— 3	0	132	— 11	0	500	— 2	1	8
40	— 3	4	140	— 11	8	600	— 2	10	0
48	— 4	0	144	— 12	0	700	— 2	18	4
50	— 4	2	150	— 12	6	800	— 3	6	8
60	— 5	0	160	— 13	4	900	— 3	15	0
70	— 5	10	170	— 14	2	1000	— 4	3	4
72	— 6	0	180	— 15	0	2000	— 8	6	8
80	— 6	8	190	— 15	10	3000	— 12	10	0
84	— 7	0	200	— 16	8	6000	— 25	0	0
90	— 7	6	210	— 17	6	12000	— 50	0	0
96	— 8	0	220	— 18	4	24000	— 100	0	0
100	— 8	4							

SHILLINGS TABLE.

s.		£	s.	s.		£	s.	s.		£	s.
20	are	1	0	120	are	6	0	300	are	15	0
30	—	1	10	130	—	6	10	400	—	20	0
40	—	2	0	140	—	7	0	500	—	25	0
50	—	2	10	150	—	7	10	600	—	30	0
60	—	3	0	160	—	8	0	700	—	35	0
70	—	3	10	170	—	8	10	800	—	40	0
80	—	4	0	180	—	9	0	900	—	45	0
90		4	10	190	—	9	10	1000	—	50	0
100	–	5	0	200	—	10	0	2000	—	100	0
110	—	5	10								

ARITHMETICAL CHARACTERS EXPLAINED.

= signifies equal to: as 20s. = £1; that is, 20s. are equal to £1.

+ signifies plus, or more, the sign of addition: as 2 + 4 = 6; that is, 2 added to 4 = 6.

— signifies minus, or less, the sign of subtraction: as 8 − 5 = 3; that is, 5 subtracted from 8 = 3.

× signifies into or by, the sign of multiplication: as 5 × 2 = 10; that is, 5 multiplied by 2 = 10.

÷ signifies divided by: as 10 ÷ 2 = 5; that is, 10 divided by 2 = 5.

: :: : signs of proportion: as 2 : 4 :: 8 : 16; that is, as 2 are to 4, so are 8 to 16.

AVOIRDUPOIS WEIGHT.

			marked
16 drams (dr.)..........	make	1 ounce	oz.
16 ounces		1 pound	℔
28 pounds................		1 quarter	qr.
4 quarters, or 112 pounds....		1 hundred weight..	cwt.
20 hundred weight		1 ton............	T.

By this weight heavy goods, and most of the common necessaries of life, are weighed.

TROY WEIGHT.

			marked
24 grains (gr.)	make	1 pennyweight ..	dwt.
20 pennyweights........		1 ounce........	oz.
12 ounces		1 pound........	℔

This weight is used for gold, silver, jewels, and some liquids.

APOTHECARIES WEIGHT.

			marked
20 grains	make	1 scruple	℈ or scru.
3 scruples		1 dram	℥ or dr.
8 drams		1 ounce......	℥ or oz.
12 ounces ··		1 pound	℔

Apothecaries use this weight in mixing their medicines; but they buy and sell by avoirdupois weight.

WOOL WEIGHT.

			marked
7 pounds........	make	1 clove......	cl.
2 cloves.............		1 stone......	st.
2 stones.............		1 tod........	td.
6½ tods ....,		1 wey	wy.
2 weys		1 sack	sa.
12 sacks		1 last........	la.

Wool only is weighed by this weight.

CLOTH MEASURE.

		marked
2¼ inches (in.)......make	1 nail..........	na.
4 nails	1 quarter	qr.
3 quarters	1 Flemish ell....	Fl. e.
4 quarters.............	1 yard	yd.
5 quarters.............	1 English ell....	E. e.
6 quarters.............	1 French ell	Fr. e.

This measure is used by linen and woollen drapers.

LONG MEASURE.

		marked
3 barley-corns (b. c.)..make	1 inch..............	in.
12 inches	1 foot	ft.
3 feet..................	1 yard.............	yd.
5½ yards	1 rod, pole, or perch .	r. or po.
40 poles.................	1 furlong...........	fur.
8 furlongs...............	1 mile.............	mi.
3 miles............... .	1 league..........	lea.
60 geographical miles, or ⎱ 69 1/10 English miles .... ⎰ ..	1 degree...........	deg.

This measure is used to measure the distances, lengths, heights, depths, &c. of places or things.

LAND OR SQUARE MEASURE.

		marked
144 inches (in.) .... make	1 square foot ...	ft.
9 square feet.............	1 square yard ...	yd.
30¼ yards, or 272¼ feet......	1 rod	r.
40 rods	1 rood.........	ro.
4 roods	1 acre.........	ac.
640 acres	1 mile	mi.

This measure is used to measure all kinds of superfices, such as land, paving, flooring, plastering, roofing, slating, tiling, and every thing that has length and breadth.

CUBIC OR SOLID MEASURE.

		marked
1728 inches (in.)......make	1 foot	ft.
27 feet	1 yard	yd.

By this measure every thing that has length, breadth, and thickness is measured.

LIQUID MEASURE.

		marked
4 gills (gi.) ....make	1 pint........	pt.
2 pints	1 quart	qt.
4 quarts..............	1 gallon......	gall.
9 gallons	1 firkin	fir.
2 firkins...............	1 kilderkin....	kil.
2 kilderkins, or 36 gallons ..	1 barrel	bar.
63 gallons	1 hogshead ...	hhd.
2 hogsheads	1 pipe or butt..	pi. or b.
2 pipes............... ...	1 tun	t.

This measure is used for all kinds of liquids.

DRY MEASURE.

		marked
2 pints (pt.)........make	1 quart	qt.
4 quarts ....,...	1 gallon	gall.
2 gallons ......·· ,....	1 peck.....	pe.
4 pecks...............,	1 bushel....	bush.
8 bushels ....,....	1 quarter ...	qr.
5 quarters...............	1 load......	lo.
2 loads	1 last	la.

By this measure are measured all *dry* commodities, such as wheat, barley, fruit, potatoes, &c.

MEASURE OF TIME.

		marked
60 seconds (sec.)........ ...make	1 minute ..	min.
60 minutes	1 hour	ho.
24 hours....................	1 day	da.
7 days	1 week	wk.
4 weeks	1 month...	mo.
12 calendar months, or 52 weeks 1 day, or 365 days, 5 hours, 48 minutes, 51 seconds	} 1 year.....	yr.

The length of the year is the time occupied by the earth in performing its revolution round the sun.

365 days make a year for three years together ; but every fourth year contains 366 days, and is called Leap-year.

By this mode of calculation, the year is considered to consist of 365 days 6 hours, at a medium; but as this is allowing rather too much, one day ought to be struck off the account in about every 130 years.

THE DAYS IN EACH MONTH.

Thirty days has September,
April, June, and November ;
February has twenty-eight alone,
And all the rest have thirty-one ;
But Leap-year coming once in four,
February then has one day more.

ASTRONOMY OR SEXAGESIMALS.

marked

	marked
60 seconds (″) make ....1 minute	′
60 minutes ....1 degree	°
30 degrees ....1 sign	s
12 signs or 360 degrees ..1 circle	o

This table is used in astronomical and geographical calculations.

.INVOLUTION.

The square of			The square of			The square of		
1	is	1	8	is	64	15	is	225
2	—	4	9	—	81	16	—	256
3	—	9	10	—	100	17	—	289
4	—	16	11	—	121	18	—	324
5	—	25	12	—	144	19	—	361
6	—	36	13	—	169	20	—	400
7	—	49	14	—	196			

The cube of			The cube of		
1	is	1	6	is	216
2	—	8	7	—	343
3	—	27	8	—	512
4	—	64	9	—	729
5	—	125	10	—	1000

USEFUL MEMORANDA.

MONEY.

	s.	d.
A guinea	21	0
A sovereign	20	0
A moidore........................	27	0
A mark	13	4
An angel	10	0
A noble	6	8
A crown	5	0
A tester........................	0	6
A groat........................	0	4
A French franc...................	0	10
A sous	0	0½
An American dollar=100 cents. (varies)	4	6

BREAD.

	℔	oz.
A peck loaf .... weighs	17	6
A half ditto	8	11
A quartern ditto	4	5½
A gallon of flour	7	0
A peck	14	0
A bushel	56	0
A sack, or 5 bushels	280	0

HAY WEIGHT.

56 lbs. of old hay } .... 1 truss
60 lbs. of new hay }

36 trusses.................... 1 load

Of straw, 36 lbs. make a truss, and 36 trusses a load.

AVOIRDUPOIS WEIGHT.

A stone, (legal) horseman's weight	14 lbs.
A stone, (customary in London and the adjoining counties), butcher's meat	8 lbs.
A tod of wool	28 lbs.
A sack of wool	364 lbs.
A quintal.................... (varies)..	112 lbs.
A fother of lead ....(..do..)..	19½ cwt.

CLOTH MEASURE.

A Flemish ell	27 in.
A yard	36 in.
An English ell	45 in.
A French ell	54 in.

LONG MEASURE.

A hand (in horse measure)	4 in.
A palm	3 in.
A span	9 in.
A cubit (varies)	18 in.
A cubit (Jewish common) nearly	22 in.
A common military pace (varies)	2 ft. 6 in.
A geometrical pace (..do..)	5 feet
A Gunter's link	$7\frac{92}{100}$ in.
A Gunter's or surveyor's chain	{ 100 links, or 4 poles, or 22 yards
A fathom	6 feet
A rod (varies)	$16\frac{1}{2}$ feet
A furlong	220 yards
A mile	1760 yards, or 5280 feet

SQUARE MEASURE.

A square of flooring, &c.	100 feet
A square acre	{ 100,000 links, or 4840 yards
A yard of land	30 acres
A hide of land	100 acres
A barony	40 hides

CUBIC MEASURE.

A load or ton of rough timber	40 feet
A load or ton of square timber	50 feet
A ton of shipping	42 feet
A stack of wood	108 feet
A cord of wood	128 feet
A solid yard of earth	1 load

LIQUID MEASURE.

An imperial gallon..................	277.274 cubic in.
An anker ....(varies)..	10 gallons
A runlet................(..do..)..	18 gallons
A tierce ....(..do..)..	42 gallons
A puncheon ....(..do..)..	84 gallons
A pipe (properly)	126 gallons
A tun	252 gallons
A pipe of Lisbon ....(varies)..	140 gallons
A pipe of port.............(..do .)..	138 gallons
A pipe of Vidonia........(..do..)..	120 gallons
A pipe of Madeira........(..do..)..	110 gallons
A pipe of sherry..........(..do..)..	130 gallons
A pipe of Teneriffe ......(..do..)..	120 gallons
A hogshead of claret......(..do..)..	57 gallons
An aum of hock..........(..do..)..	36 gallons
An aum of cape..........(..do..)..	20 gallons

French wines are usually sold in bottles.

DRY MEASURE.

A pottle ......·	2 quarts
A bushel.......................	2218.192 cubic in.
A sack of coals,* potatoes, fruit, &c. ..	3 bushels heaped
A chaldron (of coals) ....12 sacks, or 36 bushels
A score ditto	21 chaldrons
A strike	2 bushels
A coom ....,..	4 bushels
A last of corn	10 quarters

STANDARD MEASURE OF CAPACITY.

5 ounces of water	1 gill
4 gills...........................	1 pint
2 pints	1 quart
4 quarts	1 gallon
2 gallons........................	1 peck
4 pecks or 8 gallons	1 bushel
8 bushels	1 quarter
5 quarters	1 load

* Coal is now sold by Avoirdupois Weight. Heaped measure is declared illegal.

APOTHECARIES' MEASURE.

60 minims	.................make	1 dram
8 drams	....	1 ounce
16 ounces	....	1 wine pint
8 pints	....	1 gallon

COMMERCIAL NUMBERS.

12 articles of any kind	....	1 dozen
13 ditto	....	1 long dozen
12 dozen	....	1 gross
12 gross, or 144 dozen	....	1 great gross
20 articles of any kind	....	1 score
5 score	....	1 hundred
6 score	....	1 great hundred
5 dozen skins of parchment	....	1 roll
72 words in common law	....	1 sheet
80 words in the Exchequer	....	1 ditto
90 words in Chancery	....	1 ditto
24 sheets of paper	....	1 quire
20 quires	....	1 ream
21½ quires, or 516 sheets	....	1 printer's ream
2 reams	....	1 bundle
5 bundles, or 10 reams	....	1 bale

Folio is the largest size of books, of which 2 leaves, or 4 pages, make a sheet

Quarto, 4to........ 4 leaves, or 8 pages, ditto

Octavo, 8vo. .... 8 leaves, or 16 pages, ditto

Duodecimo, 12mo..12 leaves, or 24 pages, ditto

Octodecimo, 18mo.18 leaves, or 36 pages, ditto

MENTAL ARITHMETIC.

First General Rule.

To find the value of any number of yards, pounds, gallons, stones, ells, &c., when the price is in pence.

Rule.

Find the value of the number of articles at one penny, and multiply it by the price.

When there is a farthing in the price, add one quarter, or ¼ of what it amounts to at one penny; when a halfpenny, add one half; when three farthings, add three quarters; and for any other fraction, work according to rule the 4th, in compound multiplication.

Example.—What will 36 lbs. cost at 5d. per lb. ?

$$
\begin{array}{r}
& \text{s.} \\
36 \text{ lbs. at 1 penny per lb.} = & 3 \\
\text{Multiplied by} & 5 \\
\hline
& 15\text{s. Ans.} \\
\hline
\end{array}
$$

Ex.—What will 144 lbs. cost at 8d. per lb. ?

$$
\begin{array}{r}
& \text{s.} \\
144 \text{ at 1d.} = & 12 \\
\text{Multiplied by} & 8 \\
\hline
& £4 \ 16 \text{ Ans.} \\
\hline
\end{array}
$$

Ex.—What will 20 yards cost at 3d. per yard ?

$$
\begin{array}{rcc}
& \text{s.} & \text{d.} \\
20 \text{ at 1 penny} = & 1 & 8 \\
& & 3 \\
\hline
& 5 & 0 \text{ Ans.} \\
\hline
\end{array}
$$

Note.—When convenient, multiply by the top line at once.

Ex.—What will 100 yards cost at 10d. per yard?

$$\begin{array}{cc} & \text{s.} \quad \text{d.} \\ 100 \text{ at 1 penny} = & 8 \quad 4 \\ & \quad 10 \\ \hline £4 \quad 3 \quad 4 \text{ Ans.} \end{array}$$

Ex.—What will 3d. a week amount to for 52 weeks?

$$\begin{array}{cc} \text{s.} \quad \text{d.} \\ 4 \quad 4 \text{ at 1 penny per week.} \\ \quad 3 \\ \hline 13 \quad 0 \text{ Ans.} \end{array}$$

Ex.—What will 9d. a day amount to in 365 days?

$$\begin{array}{cc} £ \quad \text{s.} \quad \text{d.} \\ 365 \text{ at 1 penny} = 1 \quad 10 \quad 5 \\ \phantom{365 \text{ at 1 penny} = 1 \quad 10} \quad 9 \\ \hline £13 \quad 13 \quad 9 \text{ Ans.} \end{array}$$

Ex.—What will 7d. a day amount to in 313 days, which, omitting Sundays, is the number of days in a year?

$$\begin{array}{cc} £ \quad \text{s.} \quad \text{d.} \\ 313 \text{ days as pence} = 1 \quad 6 \quad 1 \\ \phantom{313 \text{ days as pence} = 1 \quad 6} \quad 7 \\ \hline £9 \quad 2 \quad 7 \text{ Ans.} \end{array}$$

Ex.—What will 48 ounces cost at 6¼ per oz.?

$$\begin{array}{cc} \text{s.} \quad \text{d.} \\ 4 \quad 0 \text{ at 1 penny per oz.} \\ 6\tfrac{1}{4} \text{ here I multiply by the top line.} \\ \hline £1 \quad 5 \quad 0 \text{ Ans.} \end{array}$$

Ex.—What will 72 lbs. cost at 8½ per lb. ?

```
        s.  d.
        6   0  at 1 penny.
           8½
       ————
    £2 11   0  Ans.
       ════
```

Ex.—What will 144 gallons cost at 10¾ per gallon ?

```
        s.  d.
       12   0  at 1 penny.
          10¾
       ————
    £6  9   0  Ans.
       ════
```

Ex.—What will 150 lbs. come to at 8¾d. per lb. ?

```
            s.  d.
      ½)   12   6   at 1 penny.
                8
          ————
           5  0   0
      ½)   6   3
           3   1½
          ————
       £5  9   4½  Ans.
          ════
```

The simplest way of dividing by ¾, is to take half of the top line, and then the half of that again.

Here the work is given at full length, to show the whole of the mental operation; though, of course, the 9s. 4½d., that is, ¾ of 12s. 6d., could have been added in as 1 multiplied by the 8, and the solution have been given in one line.

EXAMPLES.

yards.	d.		£.	s.	d.	ells.	d.		£.	s.	d.
24 at 1 ℣ yd.—Ans.			0	2	0	96 at 1 per ell—			0	8	0
2	——		0	4	0	6	——		2	8	0
3	——		0	6	0	6½	——		2	12	0
4	——		0	8	0	7	——		2	16	0
5	——		0	10	0	7½	——		3	0	0
6	——		0	12	0	8	——		3	4	0
7	——		0	14	0	8½	——		3	8	0
8	——		0	16	0	9	——		3	12	0
9	——		0	18	0						
10	——		1	0	0						
11	——		1	2	0						
12	——		1	4	0	oz.	d.				

lbs.	d.		£.	s.	d.	oz.	d.		£.	s.	d.
36 at 1 per ℔.—			0	3	0	144 at 1 per oz—			0	12	0
2	——		0	6	0	9	——		5	8	0
4	——		0	12	0	9¼	——		5	11	0
6	——		0	18	0	9½	——		5	14	0
8	——		1	4	0	9¾	——		5	17	0
10	——		1	10	0	10	——		6	0	0
12	——		1	16	0	10¼	——		6	3	0

oz.	d.		£.	s.	d.				£.	s.	d.
						10½	——		6	6	0
48 at 1 pr oz.—			0	4	0	10¾	——		6	9	0
3	——		0	12	0	11	——		6	12	0
6	——		1	4	0	11¼	——		6	15	0
9	——		1	16	0	11½	——		6	18	0
12	——		2	8	0	11¾	——		7	1	0
						12	——		7	4	0

stones.	d.		£.	s.	d.	lbs.	d.		£.	s.	d.
60 at 1 per st.—			0	5	0						
2	——		0	10	0						
2½	——		0	12	6	lbs.	d.				
3	——		0	15	0	20 at 1 per ℔.—			0	1	8
3½	——		0	17	6	2	——		0	3	4
4	——		1	0	0	3	——		0	5	0
4½	——		1	2	6	4	——		0	6	8
5	——		1	5	0	5	——		0	8	4
5½	——		1	7	6	5½	——		0	9	2
6	——		1	10	0	6	——		0	10	0

yards. d.	£. s. d.	da. d.	£. s. d.
100 at 1 pr yd —	0 8 4	31 at 2 per day	0 5 2
2 —	0 16 8	3 —	0 7 9
3 —	1 5 0	5½ —	0 14 2½
4 —	1 13 4	8 —	1 0 8
5 —	2 1 8	11 —	1 8 5
5½ —	2 5 10	wks. d.	
6 —	2 10 0	52 at 1 per week	0 4 4
		2 —	0 8 8
		3½ —	0 15 2
oz. d.		6½ —	1 8 2
12 at 3¼ pr oz—	0 3 3	9 —	1 19 0
3¾ —	0 3 9	11¼ —	2 8 9
7¼ —	0 7 3	lbs. d.	
9¾ —	0 9 9	56 at 1¼ pr ℔—	0 5 10
11¼ —	0 11 3	2 —	0 9 4
11¾ —	0 11 9	3½ —	0 16 4
		5 —	1 3 4
		6½ —	1 10 4
oz. d.		8 —	1 17 4
16 at 1½ per oz.	0 2 0	10½ —	2 9 0
2½ —	0 3 4	lbs. d.	
3 —	0 4 0	112 at 1 per ℔.—	0 9 4
5½ —	0 7 4	1½ —	0 14 0
6 —	0 8 0	2 —	0 18 8
7½ —	0 10 0	3 —	1 8 0
9 —	0 12 0	3½ —	1 12 8
		4 —	1 17 4
		5½ —	2 11 4
lbs. d.		6 —	2 16 0
28 at 2 per ℔.—	0 4 8	8½ —	3 19 4
3½ —	0 8 2	9 —	4 4 0
5 —	0 11 8	10½ —	4 18 0
7½ —	0 17 6	11¾ —	5 9 8
9 —	1 1 0	da. d.	
		313 at 1 per day	1 6 1
da. d.		2 —	2 12 2
30 at 4 per day	0 10 0	4 —	5 4 4
4½ —	0 11 3	6 —	7 16 6
6 —	0 15 0	8 —	10 8 8
8½ —	1 1 3	10 —	13 0 10
10 —	1 5 0		

EXAMPLES.

da.	d.		£.	s.	d.	yards.	d.		£.	s.	d.
365 at	1 per day		1	10	5	40 at	10	——	1	13	4
	2	——	3	0	10	45	2	——	0	7	6
	3	——	4	11	3	52	2¼	——	0	10	10
	4	——	6	1	8	56	3	——	0	14	0
	5	——	7	12	1	77	3	——	0	19	3
	6	——	9	2	6	88	4	——	1	9	4
	7	——	10	12	11	110	5	——	2	5	10
	8	——	12	3	4	112	7	——	3	5	4
	9	——	13	13	9	120	7½	——	3	15	0
	10	——	15	4	2	136	3	——	1	14	0
	11	——	16	14	7	150	8¼	——	5	6	3
	11½	——	17	9	9½	182½	4	——	3	0	10
yards.	d.					190	6	——	4	15	0
12 at	2 per yd—		0	2	0	200	2¼	——	2	1	8
13	1½	——	0	1	7½	240	11¾	——	11	15	0
16	4	——	0	5	4	300	5	——	6	5	0
18	2	——	0	3	0	313	3	——	3	18	3
20	3	——	0	5	0	365	1½	——	2	5	7½
24	4½	——	0	9	0	400	2	——	3	6	8
26	4	——	0	8	8	500	6	——	12	10	0
28	5	——	0	11	8	600	7	——	17	10	0
30	8¼	——	1	0	7½	700	8	——	23	6	8
31	7	——	0	18	1	800	9	——	30	0	0
36	9½	——	1	8	6	900	10	——	37	10	0
						1000	11	——	45	16	8

SECOND GENERAL RULE.

When the price is in shillings.

RULE.

Consider the number of articles as shillings, and multiply by the shillings in the price.

If threepence should occur in the price, add one quarter of what it amounts to at a shilling; if fourpence, add one third: if sixpence, add one half; if ninepence, add three quarters of what it amounts to at a shilling.

When the pence in the price are not an aliquot part of a shilling, find for the shillings by this Rule, and for the pence by the Rule for pence, and add the amounts together.

EXAMPLES.

What will 29 yards cost at 3s per yard?

$$
\begin{array}{lrr}
 & \pounds. & s. \\
\text{29 yards at 1 shilling} = & 1 & 9 \\
\text{Multiplied by} & & 3 \\
\hline
\pounds 4 & 7 & \text{Ans.} \\
\end{array}
$$

What will 43 yards cost at 6s per yard?

$$
\begin{array}{lrr}
 & \pounds. & s. \\
\text{43 yards, as shillings} = & 2 & 3 \\
 & & 6 \\
\hline
\pounds 12 & 18 & \text{Ans.} \\
\end{array}
$$

What will 68 yards cost at 11s per yard?

$$
\begin{array}{lrr}
 & \pounds. & s. \\
\text{68 at 1 shilling} = & 3 & 8 \\
 & & 11 \\
\hline
\pounds 37 & 8 & \text{Ans.} \\
\end{array}
$$

What will 23½ gallons cost at 4s per gallon?

$$
\begin{array}{lrrr}
 & \pounds. & s. & d. \\
\text{23½ at 1 shilling} = & 1 & 3 & 6 \\
 & & & 4 \\
\hline
\pounds 4 & 14 & 0 & \text{Ans.} \\
\end{array}
$$

What will 85¾ lbs. cost at 8s. per lb.?

$$
\begin{array}{lrrr}
 & \pounds & s. & d. \\
\text{85¾ lbs. as shillings} = & 4 & 5 & 9 \\
 & & & 8 \\
\hline
\pounds 34 & 6 & 0 & \text{Ans.} \\
\end{array}
$$

What will 31¼ oz. come to at 5s. per oz.?

$$
\begin{array}{lrrr}
 & \pounds & s. & d. \\
\text{31¼ at 1 shilling} = & 1 & 11 & 3 \\
 & & & 5 \\
\hline
\pounds 7 & 16 & 3 & \text{Ans.} \\
\end{array}
$$

What will 80 gallons come to at 3s. 3d. per gallon ?

$$\begin{array}{r} \pounds \\ \text{80 gallons, as shillings} = 4 \\ 3\tfrac{1}{4} \\ \hline \pounds13 \quad 0 \quad \text{Ans.} \\ \hline\hline \end{array}$$

What will 140 yards cost at 4s. 6d. per yard?

$$\begin{array}{r} \text{140 yards as shillings} = \pounds7 \\ 4\tfrac{1}{2} \\ \hline \pounds31 \quad 10 \quad \text{Ans.} \\ \hline\hline \end{array}$$

What will 45¾ lbs. come to at 5s. 6d. per lb. ?

$$\begin{array}{r} \pounds \quad s. \quad d. \\ \tfrac{1}{2})2 \quad 5 \quad 9 \quad \text{at 1 shilling.} \\ 5 \\ \hline 11 \quad 8 \quad 9 \\ 1 \quad 2 \quad 10\tfrac{1}{2} \\ \hline \pounds12 \quad 11 \quad 7\tfrac{1}{2} \quad \text{Ans.} \\ \hline\hline \end{array}$$

What will 72¼ lbs. come to at 8s. 4d. per lb. ?

$$\begin{array}{r} \pounds \quad s. \quad d. \\ \tfrac{1}{3})3 \quad 12 \quad 3 \quad \text{at 1 shilling.} \\ 8\tfrac{1}{3} \\ \hline 28 \quad 18 \quad 0 \\ 1 \quad 4 \quad 1 \\ \hline \pounds30 \quad 2 \quad 1 \quad \text{Ans.} \\ \hline\hline \end{array}$$

What will 110 yards cost at 5s. 5d. per yard?

$$\begin{array}{r} \pounds \quad s. \quad d. \\ \text{110 at 1 shilling} = 5 \quad 10 \quad 0 \\ 5 \\ \hline 27 \quad 10 \quad 0 \\ 2 \quad 5 \quad 10 \\ \hline \pounds29 \quad 15 \quad 10 \quad \text{Ans.} \\ \hline\hline \end{array}$$

$$\begin{array}{r} s. \quad d. \\ \text{110 at 1 penny} = 9 \quad 2 \\ 5 \\ \hline \pounds2 \quad 5 \quad 10 \\ \hline\hline \end{array}$$

What will 252¼ yards cost at 9s. 2d. per yard?

	£	s.	d.			£	s.	d.
252¼ as shillings =	12	12	3	252¼ as pence =	1	1	0¼
			9					2
	113	10	3			2	2	0½
	2	2	0½					
	£115	12	3½	Ans.				

			Answer.						Answer.
yards.	s.	d.	£ s. d.	oz.	s.	d.	£ s. d.
60 at	1	0 per yard	3 0 0	100 at	8	6 per oz.	42 10 0
	2	0 —	6 0 0		9	0 —	45 0 0
	3	0 —	9 0 0		9	6 —	47 10 0
	4	0 —	12 0 0		10	0 —	50 0 0
	5	0 —	15 0 0		10	6 —	52 10 0
	6	0 —	18 0 0		11	0 —	55 0 0
	7	0 —	21 0 0		11	6 —	57 10 0
	8	0 —	24 0 0		12	0 —	60 0 0
	9	0 —	27 6 0				
	10	0 —	30 0 0	stones.			
	11	0 —	33 0 0	120 at	1	0 pr. stone	6 0 0
	12	0 —	36 0 0		3	0 —	18 0 0
lbs.					6	6 —	39 0 0
80 at	1	0 per ℔	4 0 0		9	3 —	55 10 0
	1	6 —	6 0 0		10	6 —	63 0 0
	2	0 —	8 0 0		11	9 —	70 10 0
	2	6 —	10 0 0		12	0 —	72 0 0
	3	0 —	12 0 0				
	3	6 —	14 0 0	ells.			
	4	0 —	16 0 0	140 at	3	0 per ell	21 0 0
	4	6 —	18 0 0		3	6 —	24 10 0
	5	0 —	20 0 0		4	0 —	28 0 0
	5	6 —	22 0 0		4	9 —	33 5 0
	6	0 —	24 0 0		5	3 —	36 15 0
oz.					6	6 —	45 10 0
100 at	1	0 per oz.	5 0 0		7	3 —	50 15 0
	6	0 —	30 0 0		8	9 —	61 5 0
	6	6 —	32 10 0		9	6 —	66 10 0
	7	0 —	35 0 0		10	1 —	70 11 8
	7	6 —	37 10 0		11	9 —	82 5 0
	8	0 —	40 0 0		12	6 —	87 10 0

yards.	s.	d.		Answer £	s.	d.
150 at 1	0	per yard	7	10	0
	2	0	—	15	0	0
	3	0	—	22	10	0
	4	0	—	30	0	0
	5	0	—	37	10	0
	6	0	—	45	0	0
	7	0	—	52	10	0
	8	0	—	60	0	0
	9	0	—	67	10	0
	10	0	—	75	0	0
	11	0	—	82	10	0
	12	0	—	90	0	0

oz.

180 at 4	0	per oz.	36	0	0
4	9	—	42	15	0
5	1	—	45	15	0
6	4	—	57	0	0
7	3	—	65	5	0
8	6	—	76	10	0
9	9	—	87	15	0
10	2	—	91	10	0
11	4	—	102	0	0
12	0	—	108	0	0

lbs.

200 at 1	0	per lb.	10	0	0
1	6	—	15	0	0
2	3	—	22	10	0
3	1	—	30	16	8
3	6	—	35	0	0

lbs.	s.	d.		Answer £	s.	d.
200 at 4	1	per lb.	40	16	8
	5	3	—	52	10	0
	6	9	—	67	10	0
	7	4	—	73	6	8
	8	3	—	82	10	0
	9	6	—	95	0	0
	10	9	—	107	10	0
	11	2	—	111	13	4
	12	6	—	125	0	0

yards.

41 at 3	0	per yd.	6	3	0
56	4	0	—	11	4	0
80	5	3	—	21	0	0
84	6	1	—	25	11	0
90½	7	0	—	31	13	6
96¼	5	0	—	24	1	3
100	8	3	—	41	5	0
112	10	1	—	56	9	4
130	9	6	—	61	15	0
163	11	0	—	89	13	0
180¾	4	0	—	36	3	0
200¼	8	6	—	85	2	1½
313	1	9	—	27	7	9
365½	1	6	—	27	7	10½
66	5	2	—	17	1	0
72	7	7	—	27	6	0
84	7	10	—	32	18	0
130½	5	5	—	35	6	10½
28	1	1½	—	1	11	6
120	11	7¾	—	69	17	6
204¾	7	9	—	79	6	9¾

To find the interest or discount upon any sum, at 5 per cent. per annum.

RULE.

Reckon a shilling for every pound, and 3d. for every 5s.

Examples.

£	s.		£	s.	d.
12	0	at 5 per cent. — Answer	0	12	0
25	0	——— —	1	5	0
30	0	——— —	1	10	0
72	0	——— —	3	12	0
89	0	——— —	4	9	0
136	0	——— —	6	16	0
24	5	——— —	1	4	3
48	10	——— —	2	8	6
87	15	——— —	4	7	9
98	5	——— —	4	18	3
129	15	——— —	6	9	9
146	10	——— —	7	6	6

To find the interest on any sum, at 5 per cent. per annum, for months.

Rule.

Consider the pounds as pence, and multiply these pence by the number of months.

	£	s.	d.		£	s.	d.
Interest on	3	0	0	for 2 months — Answer	0	0	6
—	6	0	0	— 3 ———	0	1	6
—	10	5	0	— 2 ———	0	1	8½
—	7	10	0	— 3 ———	0	1	10½
—	50	0	0	— 4 ———	0	16	8
—	66	0	0	— 6 ———	1	13	0
—	72	0	0	— 4 ———	1	4	0
—	84	10	0	— 8 ———	2	16	4
—	129	15	0	— 2 ———	1	1	7½
—	300	10	0	— 2 ———	2	10	1
—	45	5	0	—10 ———	1	17	8½
—	144	15	0	— 7 ———	4	4	5¼

To find the interest on any sum, at 5 per cent. for any number of days.

Rule.

Multiply either the money or the days by one-third of the money or the days; cut off the unit figure, and you

have the answer in pence; multiply the unit figure by 4, cut off the right-hand figure and the remaining one is farthings.*

Ex.—What is the interest of £75 for 33 days?

£75
Multiplied by...... 11 = ⅓ of 33 days.
                    ─────
                    82,5
                       4   82½d.=6s. 10½d.
                    ─────
                    2,0   minus 1d.=6s. 9½=Ans.

EXAMPLES.

	£				£	s.	d.
Interest on	20	for	6 days — Answer		0	0	4
—	24	—	8	───────	0	0	6¼
—	36	—	12	───────	0	1	2¼
—	40	—	9	───────	0	1	0
—	45	—	10	───────	0	1	3
—	51	—	7	───────	0	0	11¾
—	60	—	5	───────	0	0	10
—	65	—	60	───────	0	10	8¼
—	45	—	40	───────	0	4	11
—	30	—	70	───────	0	5	9
—	39	—	20	───────	0	2	1½
—	76	—	6	───────	0	1	3
—	82	—	15	───────	0	3	4½
—	27	—	14	───────	0	1	0½
—	66	—	27	───────	0	4	10½
—	25	—	24	───────	0	1	7¾
—	125	—	36	───────	0	12	4
—	115	—	54	───────	0	17	0
—	183	—	61	───────	1	10	7
—	240	—	73	───────	2	8	0

---

* Strict accuracy would require $\frac{1}{73}$ to be deducted from the result, but 1d. for every 6s., that is, $\frac{1}{72}$ will be found sufficiently exact for practical purposes. One penny, therefore, should be deducted from the answer of the example worked, making the true answer to be 6s. 9½d.

To find the gain per cent.

RULE.

Find what part the gain is of the first cost, and divide £100 by the same, the product is the gain per cent.

Ex.—Bought silk handkerchiefs at 4s. and sold them at 5s. each; what is the gain per cent?

$$
\text{1s. gain is of cost price } \tfrac{1}{4})\overset{£}{100}
$$

$$
\underline{£25 \text{ gain per cent.}}
$$

Ex.—Bought at 10d. and sold at 11½d.; what is the gain per cent?

$$
\text{1d. of 10d. is } \tfrac{1}{10})\overset{£}{100}
$$
$$
\tfrac{1}{2}\text{ of 1d. is }\tfrac{1}{2}\ldots) \overline{10}
$$
$$
\underline{5}
$$
$$
£15 \text{ gain per cent}
$$

EXAMPLES.

Bought at		Sold at		Gain.				
s.	d.	s.	d.	£				
0	2 —	0	3	Ans. 50 per cent.				
0	4 —	0	5	— 25 —				
0	6 —	0	9	— 50 —				
0	6 —	0	10½	— 75 —				
0	6 —	0	12	— 100, or cent. per cent.				
0	8 —	0	10	— 25 per cent.				
0	10 —	0	11	— 10 —				
0	10 —	0	10½	— 5 —				
2	0 —	3	0	— 50 —				
4	0 —	5	0	— 25 —				
5	0 —	7	6	— 50 —				
2	6 —	3	0	— 20 —	£	s.	d.	
5	0 —	5	10	— 16⅔ or	16	13	4	per cent.
8	0 —	9	0	— 12½ —	12	10	0	—
6	0 —	6	6	— 8⅓ —	8	6	8	—
1	0 —	1	0½	— 4⅙ —	4	3	4	—

c

Bought at	Sold at	Gain.		
s. d.	s. d.	£	£ s. d.	
2 6 —	3 0½	Ans. 21⅔ or	21 13 4	per cent.
2 0 —	2 8	— 33⅓ —	33 6 8	—
10 0 —	10 9	— 7½ —	7 10 0	—
15 0 —	16 0	— 6⅔ —	6 13 4	—

COMPOUND MULTIPLICATION

Is the method of finding the amount of any given number of different denominations, by repeating it any proposed number of times; and is only a short way of performing compound addition.

1.   When the multiplier does not exceed 12.

Rule.

Place the multiplier under the pence of the multiplicand, multiply the lowest denomination of the multiplicand by it, and divide the product by the number of that denomination contained in the next higher denomination; set down the remainder, and carry the quotient to the product of the next higher denomination.   Proceed thus till all the denominations are multiplied.

Ex.—Multiply £324 : 12 : 6½d. by 5.

$$\begin{array}{rrr} £ & s. & d. \\ 324 & 12 & 6\frac{1}{2} \\ & & 5 \\ \hline £1623 & 2 & 8\frac{1}{2} \end{array}$$

I multiply first the ½ by 5=10; but 10 farthings make 2½d., I put down the ½ and carry 2; 5 times 6 are 30, and 2 are 32; 32 pence are 2s. 8d., I put down the 8d. and carry 2; 5 times 12 are 60, and 2 are 62 shillings, or £3 : 2s., I put down the 2s. and carry 3 to the pounds; the rest as in Simple Multiplication.

Ex.	£	s.	d.			Ex.	£	s.	d.		
1	1	1	1½	×	2	41	121	2	6¼	×	3
2	1	2	3¾	×	4	42	156	8	4¼	×	9
3	1	4	6	×	3	43	140	0	1½	×	7
4	1	8	10	×	5	44	147	2	5	×	11
5	2	4	8½	×	2	45	231	4	6	×	4
6	3	6	2¼	×	3	46	310	11	2	×	6
7	5	2	6½	×	5	47	358	6	2½	×	8
8	6	1	8	×	7	48	381	3	6	×	10
9	4	8	2½	×	4	49	421	5	10¾	×	5
10	3	8	2¼	×	6	50	268	14	1	×	12
11	2	1	4¼	×	8	51	412	10	2¼	×	2
12	4	4	4¼	×	10	52	716	8	10¾	×	6
13	8	6	8	×	6	53	817	18	6½	×	5
14	4	3	6¼	×	4	54	610	10	10½	×	10
15	9	3	4	×	8	55	876	11	3¼	×	4
16	6	10	4½	×	7	56	714	18	6¼	×	7
17	5	1	8¾	×	4	57	680	8	1¾	×	3
18	7	14	10	×	5	58	146	11	11¾	×	5
19	7	19	11¼	×	9	59	187	1	6¼	×	6
20	4	12	8	×	12	60	761	4	0¼	×	10
21	10	12	8	×	7	61	616	6	2⅛	×	5
22	12	15	2¼	×	6	62	768	11	0¾	×	12
23	14	13	7½	×	10	63	718	2	10¼	×	4
24	21	18	2	×	8	64	180	16	8½	×	11
25	26	4	5⅛	×	6	65	616	8	2¼	×	7
26	38	14	8	×	12	66	608	8	6¾	×	6
27	41	3	8¼	×	8	67	162	13	7½	×	4
28	51	10	4	×	10	68	186	7	6¼	×	7
29	71	4	6	×	4	69	183	18	6¾	×	3
30	76	6	4½	×	6	70	336	7	8¾	×	10
31	84	16	8¾	×	3	71	761	4	1¼	×	4
32	87	11	10½	×	9	72	429	9	9¾	×	9
33	42	0	0¼	×	11	73	116	18	8¼	×	6
34	34	16	0¾	×	5	74	762	16	8¼	×	11
35	79	19	11¾	×	2	75	871	14	6¼	×	7
36	47	4	10½	×	7	76	841	18	7¼	×	7
37	91	4	7⅛	×	5	77	801	16	2¾	×	4
38	60	10	1¼	×	3	78	310	1	11⅛	×	5
39	41	3	8¼	×	8	79	718	4	0¼	×	9
40	45	11	8	×	6	80	781	10	11¼	×	12

	£	s.	d.				£	s.	d.	
Ex.81	1701	3	9¾	×	10	Ex.91	4918	11	0¾	× 6
82	2670	6	6¼	×	8	92	8161	14	10¼	× 7
83	1416	11	10¼	×	4	93	1808	7	6¼	× 8
84	8007	14	6¼	×	5	94	7186	8	11¼	× 9
85	1806	14	8¾	×	7	95	1843	15	2¼	× 11
86	9001	4	11¼	×	10	96	7810	6	2¼	× 12
87	7180	8	1¼	×	8	97	8764	4	7¾	× 12
88	7888	8	8¼	×	9	98	7187	18	1¾	× 10
89	1801	19	1¼	×	10	99	7690	18	10¼	× 12
90	4187	15	6¾	×	10	100	9999	19	11¾	× 12

2.—When the multiplier exceeds 12, and is a composite number contained in the Table.

RULE.

Multiply the multiplicand by one of the component parts, and that product by the other.

Ex.—Multiply £110 2s 3¼d by 24.

$$
\begin{array}{ccc}
\pounds. & s. & d. \\
110 & 2 & 3\frac{1}{4} \\
 & & 6 \\
\hline
660 & 13 & 7\frac{1}{2} \\
 & & 4 \\
\hline
\text{Ans.}\quad 2642 & 14 & 6 \\
\hline
\end{array}
$$

Here 6 × 4 = 24. I therefore multiply by 6, and that product by 4, which gives the true answer.

	£	s.	d.				£	s.	d.	
Ex. 1	710	18	1¼	×	16	Ex. 11	171	1	8	× 35
2	318	11	8¾	×	20	12	793	13	2¼	× 44
3	816	4	1½	×	15	13	618	18	6¼	× 27
4	181	16	1	×	32	14	871	0	5½	× 50
5	718	10	11¼	×	25	15	718	0	0¾	× 18
6	717	17	6½	×	21	16	171	14	3	× 48
7	816	2	1¾	×	30	17	877	7	7¼	× 15
8	810	1	10½	×	36	18	763	8	5¾	× 60
9	789	3	2½	×	24	19	189	16	11	× 54
10	171	6	3½	×	40	20	780	5	3	× 72

Ex.	£	s.	d.	×		Ex.	£	s.	d.	×	
21	761	8	4	×	66	61	182	6	7¾	×	72
22	718	14	6¾	×	81	62	33	19	8¼	×	44
23	313	13	7¼	×	88	63	471	16	0¾	×	28
24	368	14	3½	×	96	64	761	2	2¼	×	121
25	181	18	8¾	×	90	65	336	1	8	×	24
26	123	10	8	×	99	66	18	7	6	×	132
27	718	7	6	×	100	67	712	1	0¼	×	21
28	310	19	11¾	×	120	68	67	6	5¼	×	144
29	361	3	5¾	×	110	69	17	8	11¼	×	110
30	612	10	6½	×	63	70	31	5	6¼	×	108
31	71	11	10¼	×	72	71	87	1	6½	×	121
32	841	6	8¼	×	48	72	17	8	2¼	×	96
33	89	6	7	×	81	73	616	3	1¼	×	144
34	762	3	3	×	49	74	712	4	8½	×	84
35	76	4	3½	×	100	75	18	3	11	×	60
36	316	8	1¼	×	64	76	87	1	6¼	×	100
37	38	3	6¼	×	99	77	76	8	10	×	50
38	700	3	10½	×	81	78	99	9	8¼	×	99
39	181	4	8¾	×	64	79	87	2	8¼	×	70
40	311	1	1¾	×	24	80	818	2	6¾	×	88
41	768	8	6¼	×	45	81	762	18	6¼	×	66
42	712	18	2¾	×	21	82	719	6	1¼	×	56
43	74	3	8¼	×	121	83	312	2	9	×	42
44	36	4	8¼	×	77	84	807	7	2¼	×	72
45	71	19	0¼	×	132	85	716	8	0¾	×	100
46	181	13	6⅛	×	90	86	910	0	10¾	×	77
47	74	18	11	×	36	87	552	3	3¼	×	64
48	36	14	3¼	×	96	88	991	15	6¼	×	110
49	31	2	2	×	72	89	811	18	1¼	×	72
50	780	0	0¾	×	99	90	711	2	4	×	84
51	761	13	8½	×	23	91	876	8	4¼	×	88
52	18	0	2¼	×	35	92	179	19	9¼	×	96
53	811	18	6¾	×	45	93	991	12	6¼	×	100
54	762	3	6	×	21	94	871	14	11¼	×	121
55	363	1	8¼	×	96	95	782	6	1¼	×	110
56	961	3	11	×	88	96	684	3	8¼	×	108
57	111	18	11	×	90	97	876	8	2½	×	120
58	14	2	2¼	×	100	98	799	18	10¼	×	121
59	416	3	6½	×	80	99	769	3	11¾	×	132
60	700	0	3¾	×	49	100	879	19	11¾	×	144

3. When the multiplier is not a composite number, or exceeds the limits of the table.

RULE.

1. Find two numbers that compose the *nearest* number to the multiplier; multiply by the component parts as before; then multiply the unit line by the odd parts, and add or subtract them as you find occasion.

2. In large numbers multiply the given price by 10, and that product by 10, and so on for 10, 100, or 1000 times the price; then multiply each product by the number of thousands, hundreds, tens, and units, that make up the number of the multiplier, and the sum of the products will be the answer.

Ex.—Multiply £12. 8s. 6½d. by 29.

£	s.	d.		
12	8	6½	×	1
		7		
86	19	9½		
		4		
347	19	2		
12	8	6½		
Ans. 360	7	8½		

The nearest composite number is 28 = 7 × 4. I therefore multiply by these two figures, and to the product I add *once* the original sum, which gives the true answer.

Ex.—Multiply £110. 10s. 11d. by 1208.

£	s.	d.		
110	10	11	×	8
		10		
1105	9	2		
		10		
11054	11	8	×	2
		10		
110545	16	8	price of 1000
22109	3	4	ditto	200
884	7	4	ditto	8
Ans.·· 133539	7	4	price of 1208

Here I multiply by 10 × 10 × 10 = 1000; to the product of which I add *twice* the hundred line, and 8 times the unit line for the odd 208, making altogether 1208.

Ex.	£	s.	d.	×		Ex.	£	s.	d.	×	
1	1	10	6½	×	37	26	761	1	8¼	×	145
2	4	8	6	×	23	27	687	6	2¾	×	122
3	2	3	3	×	41	28	701	1	6	×	147
4	6	10	8¾	×	34	29	768	0	1¼	×	135
5	4	8	6	×	46	30	610	8	1¼	×	119
6	9	8	6½	×	38	31	710	6	8¼	×	197
7	3	8	1¼	×	43	32	718	6	2¼	×	212
8	10	1	2¼	×	47	33	799	0	1¾	×	316
9	1	17	0¼	×	46	34	416	8	6¾	×	469
10	12	1	8¼	×	39	35	316	1	11¼	×	562
11	2	3	6	×	19	36	313	1	6½	×	768
12	14	1	6¾	×	26	37	118	1	6	×	810
13	2	1	10¼	×	17	38	216	1	8¼	×	761
14	18	0	8	×	51	39	121	18	7	×	1001
15	1	8	3¾	×	13	40	368	7	6	×	1342
16	20	8	2	×	53	41	816	1	6¼	×	1456
17	21	18	1¾	×	57	42	781	6	2	×	1910
18	31	12	6	×	61	43	799	8	6	×	1768
19	38	9	8¼	×	59	44	612	13	4¼	×	1957
20	69	1	1	×	71	45	1710	1	6¼	×	2364
21	72	6	3	×	65	46	2712	1	6¼	×	3860
22	84	0	0¾	×	79	47	1680	1	8	×	7182
23	78	1	11¾	×	69	48	4681	10	11	×	8768
24	71	8	6	×	89	49	1187	4	6	×	9678
25	91	1	8	×	98	50	5679	8	10¾	×	10999

4. When the multiplier is a whole number, with fractional parts annexed.

RULE.

Multiply by the number, or the component parts of the number, as before ; then for ½, ⅓, ¼, ⅕, or ⅙, &c.; divide the top line by 2, 3, 4, 5, or 6, &c. ; but if the upper figure of the fractional part be greater than 1, multiply the top line by it separately, and divide the product by the lower figure ; add this quotient to the product, obtained by multiplying with the whole number.

Ex.—What cost 56½ chaldrons at

$$\begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ \tfrac{1}{2})\ 1\ \ 14\ \ \ 9 \ \ \text{per chaldron} \\ 7 \end{array}$$

$$\begin{array}{r} 12\ \ \ 3\ \ \ 3 \ \ \text{price of 7} \\ 8 \end{array}$$

$$\begin{array}{r} 97\ \ \ 6\ \ \ 0 \ \ \text{price of 56} \\ 17\ \ \ 4\tfrac{1}{2}\ \text{price of }\tfrac{1}{2} \end{array}$$

Ans... 98   3   4½ price of 56½

Ex.—What cost 4⅝ yards at

$$\begin{array}{r} \text{£.} \quad \text{s.} \quad \text{d.} \\ 7\ \ \ 6 \ \ \text{per yard} \\ 4 \end{array}$$

1 10   0 price of 4   7   6
     4   2 price of ⅝   5

Ans.. 1 14   2 price of 4⅝   9)37 6

                                    4   2

Ex.	£	s.	d.			Ex.	£	s.	d.	
1	1	1	6½	×	3¼	15	19	19	1¼	× 18¾
2	1	10	8¼	×	4½	16	12	18	1	× 17½
3	2	6	8	×	4¼	17	27	18	4½	× 20⅕
4	3	7	8	×	5¼	18	18	10	11¼	× 17⅙
5	2	1	6	×	5½	19	18	7	6¼	× 32⅜
6	8	7	6¼	×	10½	20	71	18	1¼	× 33½
7	7	8	7¼	×	12½	21	31	1	6½	× 40¾
8	7	8	8	×	14¾	22	84	8	6	× 59⅜
9	8	7	2¼	×	18¼	23	44	8	6½	× 50 1/10
10	7	18	6¼	×	20½	24	72	14	8	× 42¼
11	7	1	10	×	24½	25	31	8	4¾	× 48¼
12	1	12	8¼	×	27¼	26	18	14	6	× 38⅝
13	10	8	8¼	×	30¼	27	18	10	7¼	× 77½
14	17	4	8¾	×	42¾	28	44	18	2	× 40⅛

	£	s.	d.				£	s.	d.	
Ex. 29	27	6	1½	× 27¼	Ex. 40		89	3	6¼	× 77¾
30	36	4	8¼	× 82⅞	41		82	18	6¼	× 57⅛
31	14	10	10	× 84¼	42		96	18	2¼	× 84¼
32	72	18	6¾	× 24⅚	43		71	2	0¾	× 42⅔
33	36	8	8¼	× 96¼	44		87	2	11¾	× 56¼
34	87	8	1¾	× 18⅔	45		81	10	10	× 18¾
35	17	11	8	× 21¼	46		71	0	6	× 34½
36	31	7	8	× 26¼	47		91	18	6¼	× 45¾
37	36	8	7	× 31½	48		79	18	2¼	× 96¾
38	14	6	2	× 14⅝	49		47	0	6¾	× 99⅝
39	18	0	6½	× 42⅓	50		81	0	5¾	× 100⅞

MISCELLANEOUS EXAMPLES.

Ex. 1.—Multiply 1s. 5½d. by 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, separately, that is, in ten separate sums.

2.—Multiply 1s. 5½d. by 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, successively, that is, in one sum.

3.—Multiply £1. 1s. 1¼d. by 3, 5, 7, 9, and 11, successively.

4.—Reverse the operation of the previous sum, that is, multiply £1. 1s. 1¼d. by 11, 9, 7, 5, and 3, successively.

5.—Multiply £2. 3s. 4½d. by 10, 100, 1000, 10,000, 100,000, and 1,000,000, separately.

6.—What cost 12lb. of tea, at 5s. 6d. per lb. ?

7.—What cost 28lb. of sugar, at 7½d. per lb. ?

8.—What is the value of 30 yds. of Irish, at 2s. 8d. per yd. ?

9.—What must I give for 120 oxen, at £15 10s. each ?

10.—What cost 56lb. of mottled soap, at 6½d. per lb. ?

11.—What must be given for 523 sheep, at £2. 1s. 8d. each ?

12.—What cost 729¼ gallons of rum, at 15s. 6d. per gal. ?

13. —1888½ cwt. of sugar, at £4. 11s. 9d. per cwt.

Ex. 14.—547⅝ lasts of wheat, at £6. 5s. per last.

    15.—1840¼ firkins of butter, at £1. 18s. 10d. per firkin.

    16.—589 yards of cloth, at 15s. 6d. per yd.

    17.—339 hides, at £1. 10s. 6d. per hide.

    18.—420 sacks of flour, at £2. 1s. 8d. per sack.

    19.—Multiply £4. 7s. 6½d. by 13, 14, 15, 16, 17, 18, 19, and 20, separately.

    20.—Multiply £5. 10s. 6d. by 11⅛, 12⅝, 13⅝, 14⅞, 15$\frac{1}{10}$, 16$\frac{3}{10}$, 17$\frac{7}{10}$, 18$\frac{9}{10}$, 19$\frac{7}{12}$, 20$\frac{11}{12}$, separately.

BILLS OF PARCELS.

EXERCISING THE RULES IN COMPOUND MULTIPLICATION.

London, January 1st, 1845.

(1) GEORGE CHASEMORE, Esq.

Bought of WILLIAM KING.

		s.	d.	£	s.	d.
6 lbs. of green tea	at	10	8	per lb.		
14 do. hyson		9	8½	—		
18 do. bohea		6	3	—		
12 do. fine green		13	6	—		
28 do. Mocha coffee		3	5	—		
				£		

Work also the foregoing bill with the following number of pounds, instead of those given, the prices remaining unaltered:—

(2)	(3)	(4)	(5)
10	12	7½	5½
28	19	20	17
36	11	14½	24½
27	8	18¾	30
18	12	36½	14

(6)   A DRAPER'S BILL.

		s.	d.	£	s.	d.
Jan. 12—10 yards of silk ....at		4	6	per yd.		
Feb. 1—39½ do. flowered silk ··		15	6½	—		
12—42 do. satin		8	7	—		
May 2—84 do. brocade ······		14	5	—		
10—71⅓ do. lace ...······		3	0¾	—		
15—29 do. muslin ·····..		5	8½	—		
				£		

Work the same with the following numbers also, the prices remaining unchanged :—

(7)	(8)	(9)	(10)
18½	14¼	20½	50¼
41	50½	81	58½
14	58	76	38
70½	88½	72	36
32⅔	80	40¼	200
119	58½	46	126

(11)   A STATIONER'S BILL.

	£	s.	d.	£.	s.	d.
120 reams of paper ······ at	1	1	6	per ream		
76 do. ·············...··	1	18	6	—		
28 do.. imperial brown·· ·	1	12	8	—		
1500 Russia pinions········	0	2	3	per hund.		
500 Hambro' do.··········	0	1	9	—		
2500 quills················	0	8	6	—		
...				£		

Use also the following numbers with the same prices :—

(12)	(13)	(14)	(15)
74	81	49	59
42	111	99	73
19	17	23	29
2500	1200	5700	3100
200	700	900	1100
2200	500	4000	3900

(16)   A CARPENTER'S BILL.

	s.	d.	£	s.	d.
46 cubit feet of oak · · · · · · · · · at	3	9 per foot			
39 do. wrought and framed · · · ·	5	6 —			
131 do. fir, framed and moulded	3	2 —			
184 feet wainscot sashes· · · · · · · ·	1	1 —			
124 do. mahogany · · · · · · · · · · · ·	1	5 —			
18 square shed-roofing· · · · · · · ·	4	10 per square			
181½ feet water trunk· · · · · · · · · · ·	0	9 per foot			
7 men's labour for 20 days· · · ·	5	0 per day			

£

(17)	(18)	(19)	(20)
38	32	42	86
42	100	119	39
152	89	36	156
210	76	88	133
36	313	92	98
9	10	15	20
200	188	220¼	119
15 men for the	12 men.	18 men.	5 men.

same number of days.

(21)   A CORN DEALER'S BILL.

	£	s.	d.	£	s.	d.
82 bushels of tares· · · · · · at		2	8 per bush.			
120¾ do. peas · · · · · · · · · · · ·		1	6½ —			
38¼ quarters of rye · · · · · ·	1	18	2 per quar.			
13¾ do. beans · · · · · · · · · ·	1	16	6 —			
189⅝ do. oats · · · · · · · · · · · ·		10	8 —			
150 do. barley · · · · · · · · · ·	1	10	6 —			

£

(22)	(23)	(24)	(25)
76½	36	81	310
88½	18½	9½	81½
79⅝	17	14¾	39¾
61½	4	2⅛	115
216	13	39½	710¼
48½	5½	40⅛	85

(26)   A BUTCHER'S BILL.

		d.	£	s.	d.
40 lbs. 2 oz. round of beef .... at	8 per lb.				
10¼ do. leg of mutton..........	8½ —				
18 lbs. 12 oz. fillet of veal	9 —				
15 lbs. 10 oz. (15⅝) shoulder do.	6 —				
12¼ lbs. leg of pork	8½ —				
6¾ lbs. quarter of lamb.............	10¼ —				
24 lbs. 2 oz. ribs of beef	8 —				
13 lbs. 6 oz. (13⅜ lbs.) sirloin do.	10 —				

£

(27)	(28)	(29)	(30)	
			lbs.	oz.
23¼	19¼	36¼	37	2
8¼	7¾	11¾	11	10
17¼	21¼	12¼	15	6
14⅛	17⅞	13¼	16	8
15½	16¾	15¾	9	14
8¼	7⅞	5¼	6	2
19⅜	18⅛	20¼	30	12
12⅛	10¼	11¼	14	14

(31)   A PAINTER AND GLAZIER'S BILL.

	s.	d.	£.	s.	d.
979 yards of painting, 3 times in oil .... at	0	6¼ per yd.			
870 do. do. and sand......	1	4 —			
24 sash frames	1	1 each ..			
1001 ft. of best Newcastle glass .	1	10½ per ft. .			
212 do. large size............	2	2½ —			
500 do. in lead work	0	10¼ —			
780 do. bird's-eye maple graining	0	3¾ —			
150 do. rosewood ......do...	0	2¼ —			

£

(32)	(33)	(34)	(35)
760	330	710	812
326	187	313	189
80	17	61	77
842	618	397	871
189	270	382	550
1000	700	400	312
660	712	817	639
142	144	159	210

(36)   A WINE MERCHANT'S BILL.

	s.	d.	£.	s.	d.
16⅔ galls. (⅛ of a pipe) of sherry, at	14	8	per gal.		
14¼ do. (¼ of a hhd.)—claret..	19	10	—		
27½ do. (¼ of a pipe)—Madeira	12	6	—		
21 do. of fine old red port ..	14	3	—		
18 do. white do...	13	6	—		
24 do. sparkling champagne	18	11	—		
30½ do. still do. at £1. 3s. 6d.	—				

£

(37)	(38)	(39)	(40)		
			galls.	qts	pts
14⅔	17	18¼	17	3	0
16	15	13¾	16	2	0
23½	25¼	26	24	3	0
30	28	36	35	0	1
48½	19	24	26	1	0
36	31	39	40	2	0
15½	18¼	10½	16	0	1

(41)   A BRICKLAYER'S BILL.

	£	s.	d.		£	s.	d.
26 rod of brick-work ....at	11	15	0	per rod			
5 do. in party-wall......	5	10	6	—			
980 feet pointing old work (roofing)	0	0	4½	per ft..			
1500 kiln-burnt bricks......	0	6	6	per hdd			
100 feet of 12 inch drain ..	0	2	0	per ft..			
36 hods of mortar........	0	0	7	per hod			
12 bricklayers for 10 days	0	4	6	per day			
8 labourers do.	0	2	6	—			

£

(42)	(43)	(44)	(45)
13	15	19½	40½
8	10	15	18½
1000	1200	1510	2110
550	750	2500	7500
70½	88	96½	150
14	19	25	70
7	9	10	18
4	6	8	12

(46)   A SLATER'S BILL.

	£	s.	d.		£	s.	d.
12 square of Westmoreland slating............at	2	13	6	per square			
5 do. Welsh ladies..	1	11	2	—			
8 do. Welsh countess	1	16	8	—			
15 slaters 10 days	0	4	8	per day..			
8 labourers do.........	0	2	3	—			
7050 nails	0	0	5	per hdd..			

£

(47)	(48)	(49)	(50)
10	8¼	9¼	15½
7	6½	11	12½
12	17	20¼	30
14	12	10	20
6	5	4	12
5020	6025	6050	9075

PRACTICE *

Practice, like Compound Multiplication, is a rule by which the value of any quantity of goods is found, the price of one article being given. In *Practice*, examples are performed by working with the *price of the article ;* but in *Compound Multiplication,* by using the *number of articles.*

TABLES OF ALIQUOT PARTS OF MONEY.

Of a pound.	Of a shilling.	Of sixpence.
s. d.	d.	d.
10 0 $=$ $\frac{1}{2}$	6 $=$ $\frac{1}{2}$	$\frac{3}{4}$ $=$ $\frac{1}{8}$
6 8 $=$ $\frac{1}{3}$	4 $=$ $\frac{1}{3}$	$\frac{1}{2}$ $=$ $\frac{1}{12}$
5 0 $=$ $\frac{1}{4}$	3 $=$ $\frac{1}{4}$	
4 0 $=$ $\frac{1}{5}$	2 $=$ $\frac{1}{6}$	Of a penny.
3 4 $=$ $\frac{1}{6}$	$1\frac{1}{2}$ $=$ $\frac{1}{8}$	
2 6 $=$ $\frac{1}{8}$	1 $=$ $\frac{1}{12}$	$\frac{1}{2}$ $=$ $\frac{1}{2}$
2 0 $=$ $\frac{1}{10}$		$\frac{1}{4}$ $=$ $\frac{1}{4}$
1 8 $=$ $\frac{1}{12}$		
1 0 $=$ $\frac{1}{20}$		

1. When the price is less than a penny.

RULE.

Divide the quantity by the aliquot parts in a penny, and the quotient by 12 and 20.

---

* Practice has its name from its general use in business, as it teaches the best and most compendious methods of answering almost all questions that occur in trade and mercantile transactions, and is to be preferred to Compound Multiplication, and also to the Rule of Three, whenever the first term is unity, and the number of articles large.

Ex.—What is the value of 3453 yards of tape, at ¾d. per yard?

In this example I say, ½ is the half of a penny, and ¼ is the half of a halfpenny. I first divide the number of yards by 2, and the answer is 1726½ pence, or the value of 3453 yards, at ½d. per yard; I then divide this sum by 2, which gives 863¼, or the value of the tape had it been only ¼d. per yard. To find the value at ¾d. per yard I add these two sums together, and 2589¾ pence is the value of the tape at ¾d. per yard; I then divide this sum by 12 to bring the pence into shillings, afterwards by 20, to bring the shillings into pounds.

```
½ | ½ | 3453
¼ | ½ | 1726½
        863¼
     12)2589¾
     2,0) 21,5  9¾
Ans. £10  15  9¾
```

What is the value of the following numbers of agate marbles, at the prices annexed?

	at ¼d.		at ½d.		at ¾d.
Ex. 1.	789	Ex. 6.	420	Ex. 11.	336
2.	467	7.	818	12.	618
3.	2178	8	976	13.	1767
4.	1890	9.	1683	14.	2187
5.	3612	10.	5862	15.	8163

2. When the price is pence, or pence and farthings.

RULE.

1. When the price is an aliquot part of a shilling, divide the given quantity by the aliquot part, and that quotient by 20.

2. When the price is not an aliquot part of a shilling, divide the quantity by some aliquot part of a shilling, then consider what part of this aliquot part the rest is, and divide the quotient thereby; add the several quotients together, and divide the sum by 20.

NOTE. When the price is pence only, and those pence not an aliquot part of a shilling, multiply by the pence, and divide by 12 and by 20.

Ex.—What is the value of 7655 yards, at 8½d per yard?

```
6 | ½ | 7655
2 | ⅓ | 3827  6
½ | ¼ | 1275 10
         318 11½
2,0)542,2  3½
Ans. £271  2  3½
```

In this example, I first divide by 2, because 6d. is the ½ of a shilling; then I take parts for the 2½d. and say, 2d. is the ⅓ of 6d., and ½ is the quarter of 2d., and, of course I divide the first quotient by 3, and that last found by 4, and having added the three quotients together, the answer is 5422s. 3½d., which, divided by 20, gives £271 : 2 : 3½d.

at 1d.	at 2d.	at 3d.
Ex. 16 1136	Ex. 36 . .. 1007	Ex. 56 3800
17 2678	37 2608	57 1170
18 4863	38 6781	58 1479
19 5872	39 5178	59 7108
20 9800	40 1976	60 1699

at 1¼d.	at 2¼d.	at 3¼d.
21 2613	41 3600	61 399
22 3681	42 1987	62 4007
23 4867	43 1848	63 7865
24 7765	44 615	64 5186
25 7863	45 7867	65 6706

at 1½d.	at 2½d.	at 3½d.
26 7813	46 1863	66 783
27 756	47 7841	67 806
28 1078	48 3680	68 7817
29 ... 964	49 761	69 371
30 2063	50 8973	70 6708

at 1¾d.	at 2¾d.	at 3¾d.
31 667	51 367	71 8768
32 5708	52 1648	72 999
33 3786	53 2863	73 863
34 8642	54 5760	74 6187
35 9678	55 7801	75 764

at 4d.		at 5½d.		at 7d.	
Ex. 76	 8009	Ex.106	 7103	Ex.136	 7891
77	 3006	107	 3178	137	 5001
78	 5802	108	 3506	138	 3199
79	 7907	109	 1695	139	... 4688
80	 1801	110	 3088	140	 7677

at 4¼d.		at 5¾d.		at 7¼d.	
81	 1038	111	 7069	141	 6858
82	 764	112	 8178	142	 7897
83	 398	113	 3807	143	 3184
84	 7608	114	 3601	144	 2676
85	... 8007	115	 879	145	 1809

at 4½d.		at 6d.		at 7½d.	
86	 7067	116	... 3009	146	 7777
87	 6181	117	 4618	147	 6846
88	 3067	118	 8164	148	 578
89	 8070	119	 7109	149	 1680
90	.. . 3976	120	 3460	150	 7677

at 4¾d.		at 6¼d.		at 7¾d.	
91	 6804	121	 8888	151	 2086
92	 7063	122	 1802	152	 876
93	 3016	123	 1976	153	 1313
94	 8164	124	 1765	154	 6808
95	 7807	125	 1666	155	 8008

at 5d.		at 6½d.		at 8d.	
96	 9999	126	 1001	156	 1321
97	 3608	127	 739	157	 784
98	 1317	128	 708	158	 7186
99	 809	129	 635	159	 8164
100	 2867	130	 1202	160	 7086

at 5¼d.		at 6¾d.		at 8¼d.	
101	 8716	131	 1792	161	 6060
102	 1364	132	 1684	162	 7861
103	 909	133	 799	163	 1329
104	 4376	134	 7163	164	 816
105	 8160	135	 6006	165	 2867

at 8½d.	*at 9¾d.*	*at 11d.*
Ex.166 990	Ex.191 8164	Ex.216 7604
167 5863	192 3086	217 786
168 1801	193 1807	218 1847
169 963	194 1189	219 2086
170 387	195 979	220 1148
at 8¾d.	*at 10d.*	*at 11¼d.*
171 4680	196 7680	221 1899
172 867	197 876	222 368
173 1184	198 1237	223 6667
174 7860	199 369	224 3785
175 5252	200 1833	225 6688
at 9d.	*at 10¼d.*	*at 11½d.*
176 3616	201 8164	226 8888
177 8060	202 7346	227 4439
178 678	203 778	228 2266
179 1816	204 876	229 5555
180 1736	205 1608	230 6666
at 9¼d.	*at 10½d.*	*at 11¾d.*
181 1802	206 7689	231 876
182 716	207 1142	232 7108
183 785	208 493	233 8060
184 4786	209 9863	234 4867
185 3544	210 872	235 3605
at 9½d.	*at 10¾d.*	*at 11¾d.*
186 3587	211 8867	236 8071
187 4086	212 3184	237 6656
188 3401	213 764	238 3182
189 2863	214 1608	239 5081
190 1836	215 1367	240 4077

3. When the price is shillings, or shillings and parts of a shilling.

RULE.

1. If they are an aliquot part of a pound, divide the quantity by that part, and the quotient is the answer.

2. If they are not an aliquot part, multiply by the shillings, and take parts for the pence.

NOTE.—When the price is shillings only, and not an aliquot part of a pound, multiply by the shillings, and divide by 20.

Ex.—What is the value of 3151 yards of Irish, at 2s. 6d. per yard ?

$$2s. 6d. \quad | \tfrac{1}{8} | \quad 3151$$

Ans.·· £393 17 6

2s. 6d. being ⅛ of a pound I divide by 8, and the quotient is the answer.

Ex.—What is the value of 2856 yards of muslin at 8s. 8d. per yard ?

d.			
6	½	2856	
		8	
		22848	
2	⅓	1428	
		476	
	2,0	2475,2	
		£1237 12	

I multiply by 8 for the shillings, and 6d being ½ of a shilling, I divide the given quantity by 2 ; then 2d. being ⅓ of 6d. I divide the last quotient by 3, and add the three sums together, which is the answer in shillings.

Ex.			s.	d.	Ex.			s.	d.
Ex.	241	861	at	1	1½	Ex.	277	275	at	4	0
	242	760	at	1	8½		278	385	at	4	6
	243	842	at	1	9½		279	761	at	4	9½
	244	381	at	1	2		280	807	at	4	11
	245	463	at	1	10		281	960	at	5	9
	246	489	at	1	11		282	899	at	5	7½
	247	768	at	1	3½		283	1120	at	5	10
	248	389	at	1	8¾		284	1296	at	5	11¾
	249	361	at	1	6¾		285	2184	at	6	0
	250	876	at	1	4½		286	1801	at	6	8
	251	568	at	1	7½		287	3780	at	6	9¾
	252	799	at	1	11½		288	1876	at	7	6
	253	362	at	1	5		289	1468	at	7	8½
	254	629	at	1	11½		290	3480	at	7	9¼
	255	844	at	1	11¾		291	3180	at	8	6
	256	867	at	2	2		292	1809	at	8	10½
	257	329	at	2	4		293	1177	at	9	4
	258	710	at	2	5½		294	7681	at	11	6
	259	777	at	2	6		295	3680	at	11	9
	260	631	at	2	7		296	3871	at	12	6
	261	751	at	2	8		297	1878	at	13	4
	262	303	at	2	9		298	962	at	14	9
	263	273	at	2	11		299	9768	at	15	7½
	264	569	at	2	10		300	8167	at	15	6
	265	606	at	2	10½		301	793	at	18	11
	266	708	at	2	9½		302	7133	at	16	8
	267	584	at	2	7¾		303	7863	at	19	6
	268	699	at	2	8½		304	3388	at	19	11¾
	269	425	at	2	11		305	6104	at	17	8
	270	999	at	2	11¾		306	8018	at	12	8¼
	271	717	at	3	1½		307	1846	at	11	11¾
	272	619	at	3	4		308	888	at	15	7
	273	510	at	3	6		309	684	at	16	8
	274	512	at	3	9		310	1001	at	17	2½
	275	736	at	3	10		311	7009	at	18	9¾
	276	816	at	3	11		312	9119	at	19	11¼

4. When the price is pounds and parts of a pound.

RULE.

Multiply the quantity by the pounds, and proceed with the rest as in the foregoing rules.

NOTE.—When there is a fraction in the given quantity, proceed with the fraction, according to Rule 4th in Multiplication.

Ex.—What is the value of 1815 cwt. of sugar, at £3. 7s. 9½d. per cwt. ?

s.	d.					
5	0	¼	1815			
			3			
			5445	s.	d.	
2	6	½	453	15	0	
	3	1/10	226	17	6	
	½	⅙	22	13	9	
			3	15	7½	
		Ans...£6152	1	10½		

Having multiplied by 3 for the pounds, I take the aliquot parts for 7s. 9½d., that is, 5s. is ¼, 2s. 6d. is ½ of that, 3d. is 1/10 of that, and ½ is ⅙ of 3d.; then adding the several sums together, I obtain the answer.

			£	s.	d.				£	s	d.
Ex.313	· 729	at	2	5	0	Ex.332	8739	at	1	15	10
314	782	at	3	4	4	333	7300	at	4	5	7½
315	1760	at	2	7	6	334	7677⅛	at	7	12	0
316	607	at	5	6	8	335	305	at	5	5	8¼
317	840	at	1	15	0	336	533	at	9	14	4
318	301	at	4	2	6	337	873	at	8	7	9½
319	784	at	3	12	6	338	680½	at	2	3	9
320	1829	at	2	9	0	339	7602	at	7	15	11
321	189	at	1	8	4	340	801	at	5	9	8
322	4644	at	1	16	8	341	8788	at	3	16	5
323	1752	at	1	19	0	342	4567¾	at	2	4	4
324	8761	at	4	8	4	343	8910	at	3	2	9¼
325	680	at	4	14	6	344	1112	at	4	6	3
326	780	at	5	5	·6	345	1314	at	2	19	11¾
327	785	at	3	13	4	346	1516	at	4	9	9¼
328	7831¼	at	2	6	8	347	1718	at	4	13	6
329	380	at	1	3	9	348	1920	at	1	19	11¾
330	376	at	2	4	6	349	2122¼	at	2	17	8¼
331	762½	at	1	14	8	350	2345¾	at	9	18	10

TABLES OF ALIQUOT PARTS.

AVOIRDUPOIS WEIGHT.

Of a ton.					*Of a cwt.*			
cwt.	qr.	lb.			qr.	lb.		
10	0	0	=	$\frac{1}{2}$	2	0	=	$\frac{1}{2}$
5	0	0	=	$\frac{1}{4}$	1	0	=	$\frac{1}{4}$
4	0	0	=	$\frac{1}{5}$		16	=	$\frac{1}{7}$
2	3	12	=	$\frac{1}{7}$		14	=	$\frac{1}{8}$
2	2	0	=	$\frac{1}{8}$		8	=	$\frac{1}{14}$
2	0	0	=	$\frac{1}{10}$		7	=	$\frac{1}{16}$
1	0	0	=	$\frac{1}{20}$				

Of a ½ cwt. or 56 lb.				*Of a ¼ cwt. or 28 lb.*		
lb.				lb.		
28	=	$\frac{1}{2}$		14	=	$\frac{1}{2}$
14	=	$\frac{1}{4}$		7	=	$\frac{1}{4}$
8	=	$\frac{1}{7}$		4	=	$\frac{1}{7}$
7	=	$\frac{1}{8}$		3½	=	$\frac{1}{8}$

Of a pound.

oz.		
8	=	$\frac{1}{2}$
4	=	$\frac{1}{4}$
2	=	$\frac{1}{8}$

TROY WEIGHT.

Of an ounce.				*Of a dwt.*		
dwt.	gr.			gr.		
10	0	=	$\frac{1}{2}$	12	=	$\frac{1}{2}$
6	16	=	$\frac{1}{3}$	8	=	$\frac{1}{3}$
5	0	=	$\frac{1}{4}$	6	=	$\frac{1}{4}$
4	0	=	$\frac{1}{5}$	4	=	$\frac{1}{6}$
3	8	=	$\frac{1}{6}$	3	=	$\frac{1}{8}$
2	12	=	$\frac{1}{8}$	2	=	$\frac{1}{12}$
2	0	=	$\frac{1}{10}$			
1	16	=	$\frac{1}{12}$			

LAND MEASURE.
Of an acre.

ro.	po.		
2	0	=	$\frac{1}{2}$
1	0	=	$\frac{1}{4}$
	32	=	$\frac{1}{5}$
	20	=	$\frac{1}{8}$
	16	=	$\frac{1}{10}$
	8	=	$\frac{1}{20}$

CLOTH MEASURE.

Of a yard.

qr.	na.		
2	0	=	$\frac{1}{2}$
1	0	=	$\frac{1}{4}$
	2	=	$\frac{1}{8}$
	1	=	$\frac{1}{16}$

Of an English ell.

qr.	na.		
2	2	=	$\frac{1}{2}$
1	1	=	$\frac{1}{4}$
1	0	=	$\frac{1}{5}$
	2	=	$\frac{1}{10}$
	1	=	$\frac{1}{20}$

Of a Flemish ell.

qr.	na.		
1	2	=	$\frac{1}{2}$
1	0	=	$\frac{1}{3}$
	3	=	$\frac{1}{4}$
	2	=	$\frac{1}{6}$
	1	=	$\frac{1}{12}$

Of a French ell.

qr.	na.		
3	0	=	$\frac{1}{2}$
2	0	=	$\frac{1}{3}$
1	2	=	$\frac{1}{4}$
1	0	=	$\frac{1}{6}$
	3	=	$\frac{1}{8}$
	2	=	$\frac{1}{12}$
	1	=	$\frac{1}{24}$

NOTE.—The aliquot parts of other Weights and Measures are easily found, by dividing the integer, or any part of it, by the quantity the aliquot part of which is required, and the quotient, if there be no remainder, will be the part sought.

5. When the given quantity is of several denominations.

RULE.

Multiply the given price by the highest denomination, as in Compound Multiplication, and take parts of the given price for the inferior denominations of the given quantity.

D

Ex.—What is the value of 36 cwt. 1 qr. 21 lb. of hops, at £3. 13s. 9d. per cwt. ?

qr.		£	s.	d.		
1	¼	3	13	9		
				6		
		22	2	6		
				6		
lb.		132	15	0	value of 36 cwt	
14	½	0	18	5¼	..	1 qr.
7	½	0	9	2½	..	14 lbs.
		0	4	7¼	..	7 lbs.
Ans...		134	7	3		

Here for 36 cwt. I multiply by 6 and by 6 ; and then I take parts for the 1 qr. 21 lb. according to the preceding table.

	cwt.	qr.	lb.		£.	s.	d.	
351.	2	2	8	at	3	6	8	per cwt.
352.	16	1	14	——	4	3	2	—
353.	14	3	12	——	5	0	6	—
354.	20	2	7	——	5	8	9	—
355.	56	1	21	——	4	12	6	—
356.	36	2	0	——	2	18	7	—
357.	44	1	7	——	3	10	2	—
358.	37	2	22	——	1	16	8	—
359.	59	1	10½	——	2	8	1	—
360.	80	3	16	——	2	11	6	—
361.	5	2	20	——	7	6	8	—
362.	17	2	17	——	1	16	8	—
363.	78	1	14	——	2	3	2	—
364.	38	0	14	——	3	12	6	—
365.	49	0	24½	——	4	6	8	—
366.	68	1	7	——	1	16	8	—
367.	37	2	26	——	3	1	1	—
368.	78	2	10	——	4	3	8	—
369.	8	1	14	——	3	8	7	—
370.	75	0	24	——	3	6	10	—

	ton.	cwt.	qr.	lb.		£.	s.	d.	
371.	9	14	1	12	at	16	7	8	per ton.
372.	12	11	3	18	——	11	16	2	—
373.	7	10	2	8	——	17	6	8	—
374.	7	9	1	7	——	14	0	6	—

	oz.	dwt.	gr.		£	s.	d.	
375.	76	2	12	at	0	4	6½	per oz.
376.	35	5	10	————	0	3	11½	—
377.	87	9	14	————	0	5	10	—
378.	46	8	14	————	0	4	8½	—
379.	89	10	0	————	3	11	10	—
380.	79	12	14	————	4	6	10	—

	yds.	qr.	na.		£	s.	d.	
381.	760	1	2	at	1	1	6	per yard.
382.	871	3	1	————	1	8	2	—

	E.E.	qr.	na.		£	s.	d.	
383.	87	3	3	at	0	15	6	per ell.

	Fr. E.	qr.	na.		£	s.	d.	
384.	999	1	1	at	1	10	6	per ell.

	ac.	ro.	per.		£	s.	d.	
385.	15	2	24	at	44	1	6	per acre.
386.	76	1	20	————	56	10	0	—
387.	78	2	18	————	1	7	6	—
388.	89	3	25	————	81	7	0	—
389.	7	1	19	————	2	8	6	—
390.	81	0	20	————	0	15	6	—
391.	360	2	20	————	0	17	6	—
392.	51	2	17	————	1	2	3	—
393.	25	1	2	————	4	6	8	—
394.	760	1	5	————	5	5	0	—
395.	761	0	30	————	1	0	6	—
396.	366	0	35	————	4	4	6	—
397.	870	1	32	————	1	10	6	—
398.	187	1	5	————	0	18	6	—
399.	359	3	10	————	50	10	6	—
400.	777	3	39	————	2	12	6	—

BILLS OF PARCELS.

EXERCISING THE RULES IN PRACTICE, BUT CHIEFLY THE LAST RULE.

(1)   SIR MATTHEW TIERNEY, Bart.

To SOMERTON TRILL BENNETT, *Dr.*

cwt.	qr.	lb.		£	s.	d.	
3	1	7 of soap········ at	2	6	6	per cwt.
7	2	14 of raw sugar ····	2	12	6	—
2	1	14 of Cheshire cheese	4	6	0	—
3	2	8 of rice ········	2	10	0	—

£ _____

Use also the following quantities with the same prices.

(2)			(3)			(4)			(5)		
cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr	lb.	cwt.	qr.	lb.
5	1	0	10	0	8	18	1	7	31	2	12
7	0	16	12	1	7	17	3	10	81	3	26
3	2	0	9	2	21	76	1	11	29	1	19
6	0	14	7	3	8	84	0	24	12	0	23

(6)   A SILVERSMITH'S BILL.

	oz.	dwt.	gr.	s.	d.	£	s.	d.
A punch bowl, weight,	21	10	12	at 5	4	per oz.		
A tankard···· —	14	5	10	6	2	—		
A tea pot and coffee pot ····· —	34	4	8	5	6	—		
12 plates ····· —	110	15	12	5	8	—		
18 spoons···· —	36	14	20	5	10½	—		
A waiter ·· · —	15	19	18	6	3	—		

£ _____

	(7)			(8)			(9)			(10)	
oz.	dwt.	gr.	oz.	dwt.	gr.	oz.	dwt.	gr.	oz.	dwt.	gr.
13	12	6	16	10	15	17	4	0	20	5	0
18	14	12	15	4	6	15	10	0	19	2	0
42	15	10	38	12	8	31	5	12	37	2	6
96	2	12	89	1	0	120	1	10	98	3	12
40	10	0	42	5	0	39	6	0	44	7	8
12	5	0	18	10	0	16	15	0	17	9	0

(11)   A LINEN DRAPER'S BILL.

		s.	d.	
1560 yards of linen ········· at		2	3	per yd.
33 ells Eng. 2 qr. 2 na. of velvet ··········· at		14	6½	per ell.
24 ells Flem. 1 qr. of muslin		4	9	—
55 ells Fr. 1 qr. 2 na. of drugget ···········		2	2½	—
21 ells Fr. 2 qr. of camlet		1	4½	—
156 yards 3 qr. 2 na. of Irish		1	8	per yd.

£

(12)			(13)			(14)			(15)		
yds.	qr.	na.	yds.	qr.	na.	yds.	qr.	na.	yds.	qr.	na.
740	1	1	336	2	2	461	3	3	1560	3	0
E. E.	qr.	na.	E. E.	qr.	na.	E. E.	qr.	na.	E. E.	qr.	na.
14	1	1	216	1	0	119	0	2	77	1	1
E. Fl.	qr.	na.	E. Fl.	qr.	na.	E. Fl.	qr.	na.	E. Fl.	qr.	na.
71	1	2	181	0	3	90	1	0	17	1	0
E. Fr.	qr.	na.	E. Fr.	qr.	na.	E. Fr.	qr.	na.	E. Fr.	qr.	na.
110	3	0	39	1	0	86	0	2	55	2	0
E. Fr.	qr.	na.	E. Fr.	qr.	na.	E. Fr.	qr.	na.	E. Fr.	qr.	na.
15	1	0	17	0	3	50	3	2	70	2	2
yds.	qr.	na.	yds.	qr.	na.	yds.	qr.	na.	yds.	qr.	na.
108	0	2	510	2	0	620	0	2	1000	1	2

(16)   MICHAEL MORRAH, ESQ.,

                                                              Dr.

To 2 puncheons of Jamaica
    rum, each 84 gallons, at   11   6   per gal.
To 5 pipes of claret......   12   4   —
To 3 pipes of sherry......   10   6   —

                                              £

                                              Cr.

By our bill on Philip Debell, Esq., exchange
    at 4s. 4d. per crown, for 915 crowns ....
By ditto on Meinherr Zimmerman, exchange
    at 4s. 6d. per crown, for 1000 crowns ....
By ditto on Monsieur Guizot, exchange at
    4s. per crown, for 1301½ crowns ·· ......

                                              £

FRANCIS LANE, & Co.

ADDITION OF WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

(1)			(2)			(3)		
cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.
1	1	10	2	1	12	4	0	6
2	1	12	3	3	17	2	0	15
3	2	2	5	1	18	8	3	21
7	0	4	9	1	20	7	3	27

(4)					(5)				
cwt.	qr.	lb.	oz.	dr.	cwt.	qr.	lb.	oz.	dr.
3	0	18	5	5	18	2	12	8	10
5	1	16	7	10	33	0	17	8	3
6	2	3	3	7	52	2	8	2	1
17	3	11	12	14	71	0	12	11	11

TROY WEIGHT.

	(6)					(7)		
lb.	oz.	dwt.	gr.		lb.	oz.	dwt.	gr.
2	3	10	12		3	4	9	17
3	0	14	8		7	6	3	12
7	3	8	0		11	11	0	3
6	3	12	1		71	0	0	21

	(8)					(9)		
lb.	oz.	dwt.	gr.		lb.	oz.	dwt.	gr.
1	0	0	10		3	5	5	12
3	8	10	20		7	2	12	18
8	10	18	17		8	0	14	20
19	3	1	12		20	7	18	1

APOTHECARIES WEIGHT.

	(10)						(11)			
lb.	oz.	dr.	scr.	gr.		lb.	oz.	dr.	scr.	gr.
12	2	3	1	10		14	1	4	0	12
7	1	5	2	12		21	0	6	1	10
4	10	4	1	16		61	3	1	1	18
3	10	2	0	14		64	0	1	2	8

	(12)						(13)			
lb.	℥	ʒ	℈	gr.		lb.	℥	ʒ	℈	gr.
8	7	6	0	7		11	2	5	1	18
1	4	3	1	11		1	3	6	0	17
2	1	0	0	14		12	0	7	2	3
6	0	5	2	19		6	5	0	0	10

CLOTH MEASURE.

(14)				(15)		
yds.	qr.	na.		E. E.	qr.	na.
61	3	3		78	4	3
14	1	2		71	3	0
84	2	2		8	0	2
7	2	3		60	3	3

(16)				(17)		
ells. Fr.	qr.	na.		ells Fl.	qr.	na.
810	0	2		31	0	2
76	4	3		76	2	3
310	5	0		81	0	2
761	5	2		94	2	3

LONG MEASURE.

(18)				(19)		
lea.	mi.	fur.		fur.	po.	yds.
14	1	6		17	39	2
7	0	7		68	31	3½
30	2	2		7	17	4½
6	1	4		21	19	1

(20)				(21)		
mi.	fur.	po.		yds.	ft.	b. c.
18	6	20		1600	1	1
71	7	14		7801	2	2
9	2	1		760	2	0
80	3	0		310	0	2

LAND MEASURE.

(22)				(23)		
a.	r.	po.		a.	r.	po.
17	2	20		66	1	4
31	3	10		71	0	7
61	0	5		31	3	39
4	3	19		17	0	11

(24)				(25)		
a.	r.	po.		a.	r.	po.
181	3	10		331	0	9
31	0	17		75	3	16
46	2	12		420	3	0
39	3	7		31	0	35
19	0	20		312	3	14

LIQUID MEASURE.

(26)				(27)		
tuns.	hhds.	gall.		pi.	gall.	qt.
21	3	51		30	120	2
18	0	46		19	63	1
71	2	19		74	92	0
13	3	61		18	49	2

(28)				(29)		
pun.	gall.	qt.		hhd.	gall.	qt.
18	60	0		41	56	2
41	30	1		19	41	0
39	42	3		32	36	1
10	7	2		4	20	3
64	70	3		65	14	1

DRY MEASURE.

(30)

bu.	qr.	bush.
360	1	6
384	0	5
71	0	3
879	1	4

(31)

loads.	qr.	bush.
19	4	6
49	2	3
81	3	2
34	2	7

(32)

qr.	bu.	p.
120	4	3
72	6	0
86	7	1
214	2	2

(33)

bu.	gall.	qt.
14	2	3
50	6	2
44	5	0
84	7	1

MEASURE OF TIME.

(34)

yrs.	mo.	weeks.
14	8	2
76	11	3
84	7	1
91	0	3

(35)

mo.	weeks.	da.
14	3	6
81	0	5
14	1	6
37	2	3

(36)

da.	hrs.	min.
14	20	59
30	14	46
7	6	13
52	18	20

(37)

hrs.	min.	sec.
77	41	32
81	35	17
89	46	39
34	19	15

ASTRONOMY.

	(38)			(39)	
signs.	deg.	min.	deg.	min.	sec.
11	15	20	41	30	20
8	17	30	16	11	12
4	5	10	45	22	35
2	24	35	76	14	15

SUBTRACTION of WEIGHTS and MEASURES.

AVOIRDUPOIS WEIGHT.

	(1)			(2)	
tons.	cwt.	qr.	cwt.	qr.	lb.
71	19	3	761	3	24
34	17	2	297	2	26

	(3)			(4)	
qr.	lb.	oz.	lb.	oz.	dr.
14	20	12	39	12	10
8	16	14	14	14	8

TROY WEIGHT.

	(5)			(6)	
lb.	oz.	dwt.	oz.	dwt.	gr.
84	10	16	68	14	12
41	8	18	46	18	20

APOTHECARIES WEIGHT.

(7)				(8)			
lb.	oz.	dr.		oz.	dr.	scru.	grs.
31	7	4		11	4	2	16
6	10	5		8	5	1	18

CLOTH MEASURE.

(9)			(10)		
yd.	qr.	na	Ell. Eng.	qr.	na.
156	1	2	81	3	1
78	3	1	27	4	3

(11)			(12)		
Ell. Fr.	qr.	na.	Ell. Fl.	qr.	na.
810	4	0	341	1	2
125	5	2	102	2	0

LONG MEASURE.

(13)			(14)		
mi.	fur.	po.	lea.	mi.	fur.
871	6	20	81	2	6
302	7	18	7	0	7

(15)			(16)		
yds.	ft.	in.	ft.	in.	b. c.
5810	2	6	59	3	1
371	0	9	27	8	2

LAND MEASURE.

(17)				(18)		
ac.	ro.	po.		ac.	ro.	po.
1009	3	0		829	0	5
520	0	17		300	3	10

LIQUID MEASURE.

(19)				(20)		
tuns.	hhds.	galls.		pi.	galls.	qt.
80	3	0		41	31	2
14	2	56		27	70	3

(21)				(22)		
hhds.	galls.	qt.		bar.	galls.	qt.
156	50	0		87	30	1
34	45	3		38	32	2

DRY MEASURE.

(23)				(24)		
la.	qr.	bu.		ld	qr.	bush.
500	2	2		57	2	0
50	8	0		41	4	3

(25)				(26)		
bush.	galls.	qt.		galls.	qt.	pt.
105	4	1		99	3	1
87	5	2		63	1	1

MEASURE OF TIME.

(27)				(28)		
yrs.	mo.	wks.		mo.	wks.	da.
7471	8	1		84	2	6
807	11	2		71	3	2

(29)				(30)		
da.	hrs.	min.		hrs.	min.	sec.
460	15	18		79	14	31
187	16	20		31	18	12

ASTRONOMY.

(31)				(32)		
s.	°	′		°	′	″
8	24	21		41	20	40
3	26	18		36	18	45

MULTIPLICATION of WEIGHTS and MEASURES.

AVOIRDUPOIS WEIGHT.

	ton.	cwt.	qr.	lb.			cwt.	qr.	lb.	
(1)	13	5	2	10	× 2	(4)	7	3	18	× 7
(2)	8	10	3	20	× 5	(5)	15	0	12	×10
(3)	18	1	3	19	×12	(6)	3	3	24	× 8

	ton.	cwt.	qr.	lb.	oz.	dr.		
(7)	14	12	2	18	12	8	×	24
(8)	11	3	0	21	10	6	×	36
(9)	68	15	3	15	8	4	×	48
(10)	24	0	0	17	11	5	×	51

TROY WEIGHT.

	lb.	oz.	dwt.	gr.				lb.	oz.	dwt.	
(11)	26	8	12	8	× 4	(14)		18	10	12	× 6
(12)	12	10	15	3	× 7	(15)		7	11	19	×10
(13)	4	3	10	18	× 9	(16)		14	0	10	× 3

APOTHECARIES' WEIGHT.

	lb.	oz.	dr.	scru.			lb.	oz.	dr.	scru.	
(17)	11	8	3	2	× 5	(19)	8	1	3	1	× 4
(18)	6	10	5	1	× 3	(20)	2	8	4	2	× 6

CLOTH MEASURE.

	yds.	qr.	na.			E. E.	qr.	na.	
(21)	159	3	1	× 4	(23)	20	4	1	× 6
(22)	31	0	2	× 9	(24)	18	3	0	× 12

LONG MEASURE.

	yds.	ft.	in.	b.c.			lea.	mi.	fur.	po.	
(25)	76	2	10	1	× 3	(27)	80	1	5	20	× 5
(26)	105	1	8	2	×10	(28)	7	1	6	12	×20

LAND MEASURE.

	ac.	ro.	po.			ac.	ro.	po.	
(29)	509	0	10	× 7	(32)	815	3	29	× 15
(30)	720	2	18	× 18	(33)	307	0	15	× 25
(31)	178	3	15	× 9	(34)	87	2	32	× 36

LIQUID MEASURE.

	hhd.	galls.	qt.			bar.	galls.	qt.	pt.	
(35)	15	16	2	× 3	(37)	7	33	1	1	× 4
(36)	37	40	1	× 5	(38)	4	35	0	1	× 6

DRY MEASURE.

	qr.	bush.	p.			gall.	qt.	pt.	
(39)	11	3	1	× 4	(41)	90	3	1	× 16
(40)	40	5	2	× 8	(42)	77	2	0	× 20

MEASURE OF TIME.

	yrs.	mo.	wks.			wks.	da.	hrs.	min.	sec.	
(43)	31	10	2	× 6	(45)	7	3	10	11	15	× 3
(44)	60	9	1	× 9	(46)	4	0	15	20	45	×10

DIVISION OF WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

	tons.	cwt.	qr.	lb.	oz.	dr.		
(1)	14	10	2	18	10	15	÷	2
(2)	7	11	0	24	12	8	÷	4
(3)	79	8	3	17	12	14	÷	7
(4)	8	1	0	11	3	5	÷	8
(5)	46	3	2	8	10	4	÷	16
(6)	3	15	2	9	0	0	÷	26
(7)	55	18	3	14	8	0	÷	14
(8)	24	16	2	18	4	8	÷	168

TROY WEIGHT.

	lb.	oz.	dwt.	gr.				lb.	oz.	dwt.	gr.		
(9)	16	8	10	8	÷	3	(11)	12	6	4	10	÷	5
(10)	51	10	14	0	÷	8	(12)	74	5	10	18	÷	12

APOTHECARIES' WEIGHT.

	lb.	oz.	dr.	scru.				oz.	dr.	scr.	gr.		
(13)	2	6	7	2	÷	2	(15)	18	4	2	15	÷	3
(14)	7	2	4	1	÷	5	(16)	26	5	2	18	÷	9

CLOTH MEASURE.

	yds.	qr.	na.				Fr. E.	qr.	na.		
(17)	172	1	2	÷	4	(19)	84	5	3	÷	8
(18)	818	0	1	÷	10	(20)	38	4	1	÷	2

LONG MEASURE.

	mi.	fur.	po.				yds.	ft.	in.		
(21)	196	5	18	÷	7	(23)	3460	1	10	÷	12
(22)	777	6	20	÷	9	(24)	7689	2	6	÷	16

LAND OR SQUARE MEASURE.

	ac.	ro.	po.				ac.	ro.	po.		
(25)	16	3	10	÷	5	(27)	100	2	10	÷	8
(26)	7	2	0	÷	20	(28)	220	1	18	÷	11

LIQUID MEASURE.

	tuns.	hhd.	galls.	qt.	pt.	gills.		
(29)	818	3	8	1	1	2	+	4
(30)	184	2	20	0	1	1	+	8
(31)	41	0	40	2	0	0	+	10
(32)	78	1	31	1	0	1	+	6

DRY MEASURE.

	la.	qr.	bush.	p.				la.	qr.	bush.	gall.		
(33)	809	8	4	2	+	2	(35)	8	2	6	3	+	4
(34)	126	9	6	1	+	7	(36)	6	3	2	6	+	10

MEASURE OF TIME.

	da.	hrs.	min.	sec.				yrs.	mo.	wks.		
(37)	86	8	20	34	+	3	(39)	7	8	2	+	6
(38)	1 1	0	18	17	+	8	(40)	1	3	3	+	11

REDUCTION.

Reduction is the bringing of one denomination into another without altering its value.

1. To bring from a higher to a lower.

RULE.

Multiply by as many of the less as make one of the greater.

Thus, to reduce £25 into shillings, I multiply the 25 by 20, because there are 20 shillings in a pound, and the answer is 500 shillings; in both cases the value is the same, that is, £25 are equal to 500 shillings.

2. To bring a lower to a higher.

RULE.

Divide by as many of the less as make one of the greater.

Thus, to bring 350 pence into shillings, I divide by 12, because 12 pence make a shilling, and the answer is 29 shillings and twopence over.

Ex.   Reduce
£   s.   d.
18   6   8½ into farthings.

20
―――――
366 shillings.
12
―――――
4400 pence.
4
―――――
Ans.   17602 farthings.

I multiply the 18 by 20, and add in the 6, which gives the number of shillings. I next multiply by 12 and take in the 8, which gives the number of pence. I then multiply by 4 and add in the ½, and I find the answer is 17602 farthings, equal to the given sum of £18 6s. 8½d.

Ex.   In 17602 farthings, how many pounds sterling?

far.
4) 17602
―――――――
12) 4400   ½
―――――――
2,0)   36,6   8½
―――――――
£18   6   8½ Ans.

I divide the 17602 farthings by 4, because 4 farthings make a penny; the answer is 4400 pence, and 2 over, which are farthings, because the remainder is always of the same denomination as the dividend. I next divide the 4400 by 12, and the answer is 366 shillings and 8 pence over; and now 366 divided by 20, gives 18 pounds and 6 shillings over; the true answer is, therefore, £18 6s. 8½d.

Ex.   1.   How many pence are there in 24 shillings?
     2.   Reduce 39 pounds into shillings.
     3.   How many farthings are there in 425 pence?
     4.   In £120 how many pence?
     5.   In 1000 guineas, how many shillings?
     6.   How many farthings are there in £14 5s. 6¾d. ?
     7.   In 298 crowns how many pence?
     8.   Reduce 826 sixpences into farthings.
     9.   In £387 15s 8d. how many pence?
   10.   In £4672 7s. 6½d. how many farthings?
   11.   In 1020 farthings how many pence?
   12.   In 3446 pence how many pounds?
   13.   How many guineas are there in 5000 farthings?
   14.   How many sixpences are there in 820 crowns?
   15.   Reduce £7642 14s. 7¾d. into farthings?

16. How many fourpences are there in 6006 half-pence ?

17. In 876432 pounds how many sixpences ?

18. In 3420 half guineas how many seven shilling pieces ?

19. How many half crowns are there in 432 pounds ?

20. In 3681 twopences how many shillings ?

21. In 8190 fourpences how many fivepences ?

22. How many half-sovereigns are there in 625 guineas ?

23. In 1268 guineas how many ninepences ?

24. How often are three farthings contained in £316 17s. 8¾d. ?

AVOIRDUPOIS WEIGHT.

Ex. How many drams are there in 120 tons. 17 cwt. 2 qrs. 16 lbs. 8 oz. 6 dr. ?

tons.	cwt.	qrs.	lbs.	oz.	dr.
120	17	2	16	8	6

20

2417
4

9670
28

77376
19340

270776
16

1624664
270776

4332424
16

25994550
4332424

69318790

I multiply by 20 and take in the 17 cwt., because 20 cwt. make a ton ; then by 4 and take in the 2, because 4 quarters make a cwt. ; then by 28 and take in the 16, because 28 lb. make a quarter ; then by 16 and take in the 8, because 16 ounces make a pound ; and again by 16 and take in the 6, because 16 drams make an ounce.

Ex.   How many tons are there in 7685469 drams ?

drams.

$$16 \begin{cases} 4/\overline{7685469} \\ \overline{4/1921367} - 1 \end{cases} \text{dr.}$$

$$16 \begin{cases} \overline{4/\ \ 480341} - 3 \\ \overline{4/\ \ 120085} - 1 \end{cases} 13 \\ \text{oz.} \end{cases} 5$$

$$28 \begin{cases} \overline{4/\ \ \ \ 30021} - 1 \\ \overline{7/\ \ \ \ \ 7505} - 1 \end{cases} \text{lb.} \\ \overline{4/\ \ \ \ \ 1072} - 1 \end{cases} 5$$

$$\overline{2,0/\ \ \ \ 26,8} - 0$$

I divide by the same numbers with which I multiplied in the last example, only in the reverse order; and instead of dividing by 16, 16, and 28, by long division, I divide by their component parts, 4×4; 4×4; 4×7. In bringing the drams into ounces I have two remainders, to find the value of which, I multiply the last remainder 3 by the first divisor 4, and take in the 1, which make 13 ounces. So with the rest.

Tons. 13   8   0   5   5   13 dr.   Ans.

Ex. 25.   In 128 cwt. how many pounds ?

26.   Reduce 7625 tons into quarters.

27.   How many ounces are there in 4 tons 15 cwt. 2 qrs. 8 lb. ?

28.   In 7 cwt. 2 qrs. 14 lbs. how many pounds ?

29.   How many tons are there in 38768943 drams ?

30.   In 2 qrs. 18 lbs. 12 oz, how many ounces ?

31.   How many pounds are there in 1347 ounces ?

32.   Bought 18 bags of hops, each weighing 2 cwt. 1 qr. 16 lbs., how many pounds in the whole ?

33.   In 368074 oz. of sugar, how many owt. ?

34.   In 3 cwt. 1 qr. 12 lbs. of coffee, how many parcels are there, each containing half a pound ?

TROY WEIGHT.

Ex.—How many grains of gold are there in a cup weighing 2 lbs. 8 oz. 4 dwts. 18 grs. ?

```
        lb.  oz. dwts. grs.
         2    8    4   18
        12

        ──
        32
        20                        Here I multiply the 2 by 12,
                               and take in the 8, for the number
        ───                     of ounces; I then multiply the 32
        644                     by 20, and take in the 4 for the
         24                     pennyweights;    and afterwards
                               the 644 by 24, and take in the
        ────                    18 for grains.
        2594
        1288
        ─────
```
Ans. 15474 grains.

Ex.—How many pounds troy are there in a million of grains ?

```
         gr.
     ⎧ 4 ) 1000000
  24 ⎨ 6 )  250000  — 0 ⎫
     ⎩                   ⎬ 16 gr.
   2,0)    4166,6  — 4 ⎭
    12)    2083   6 dwt.
         ───────────────────
          ℔. 173  7  6  16 gr... Ans.
```

Instead of dividing by 24 by long division, I have divided by the component parts 6 and 4. In the second division there is a remainder of 4 ; to find the value of which I multiply it by the first divisor ; of course the true remainder is 16 grs.

Ex. 35.—In 25 pounds of gold, how many pennyweights ?

36.—In 3864 grains of gold dust, how many ounces ?

37.—In a silver snuff box, weighing 8 oz. 6 dwt., how many grains ?

38.—How many silver table spoons, each weighing 4 oz. 12 dwt. can be made out of 3 lbs. 4 oz. 18 dwt. of silver ?

APOTHECARIES' WEIGHT.

Ex.—How many grains are there in 3 lbs. 6 oz. 3 dr. 1 scru. 16 gr.?

```
      lb.  oz.  dr.  scr.  gr.
      3    6    3    1     16
      12
      ────
      42
       8
      ────
      339
        3
      ─────
      1018
        20
```

I multiply the pounds by 12, and take in the 6, because 12 ounces make a pound; afterwards by 8, 3, and 20, taking in the several drams, scruples, and grains, as in the former articles.

Ans. 20376 grains.

Ex.—In 87610 grains, how many pounds?

```
        gr.
2,0) 8761,0
  3 ) 4380   10 gr.
  8 ) 1460    0 scru.
 12 )  182    4 dr.
     lb. 15  2  4  0  10 gr. ··Ans.
```

The multipliers in the last example are made divisors in this, in the reverse order.

Ex. 39.—In 45 lbs, 6 oz. of rhubarb, how many scruples?

    40.—In 38016 grains, how many pounds?

    41.—How many scruples are there in one hundred and six ounces of Peruvian bark?

    42.—In 8 oz. 5 dr. 2 scru. 12 grs. of calomel, how many grains?

    43.—A patient is required to take half a scruple of quinine a day, how long will 1 lb. last him?

WOOL WEIGHT.

Ex.—How many stone are there in 8 weys of wool ?

```
        weys.
     ½ ) 8
         6½
        ───
         48        I multiply first by 6½, because 6½
          4        tods make a wey, and then by 2, be-
        ───        cause 2 stone make a tod.  A shorter
         52        way would have been to multiply by
          2        13 at once.
        ───
```

Ans. 104 stone.

Ex.—In 812 stone of wool, how many weys ?

```
     stone.           The readiest way of working this
  13 ) 812        example is to divide the stone by 13,
     ───          because 13 stone make one wey.
weys  62 6 stone, or 62 weys, 3 tods…Ans.
```

Ex. 44.—In a pack of wool, weighing 2 cwt. 1 qr., how
        many tods are there ?

  45.—How many pounds are there in a sack of wool ¿

CLOTH MEASURE.

Ex.—How many nails are there in 128 ells of cambric ?

```
              E. E.
              128
                5
              ───
              640
                4
              ───
```

Ans.… 2560 nails.

Ex.—In 1800 inches of cotton, how many yards are there ?

in.

9) 1800

4) 200

Ans. . . . . . 50 yds.

Here I divide by nine, because 9 inches make a quarter of a yard, and it is easier to divide by 9, than by 2¼; and then by 4.

Ex. 46.—How many English ells are there in five thousand and sixty nails ?

47.—Reduce 18 yds. 2 qr. 3 na. 1 inch into half inches.

48.—Reduce 826 French ells into nails.

49.—How many nails are there in 1050 Flemish ells ?

50.—From a piece of linen containing 36 English ells, how many shirts can be made, each requiring 3½ yards ?

51.—How many suits may be made from 18 yds. 2 qrs. of cloth, each suit containing 3½ yards ?

LONG MEASURE.

Ex.—How many yards are there between London and Sheffield, the distance of which is 160 miles ?

miles.

160

8

1280

40

½) 5120 0

5½

256000

·25600

Ans. 281600 yds.

A shorter way would be to multiply the 160 by 1760, the number of yards in a mile; thus—

1760

160

105600

1760

281600 yds.

Ex.—In 861804 feet, how many leagues ?

<div style="columns">

ft.

3)   861804

    287268

       2

11) 574536

4,0) 5223,0 — 6 = 3 yds.

8)   1305 — 30

3)   163 — 1

lea .. 54 1 1 30 3 yds. Ans.

I first bring the feet into yards, by dividing by 3; then, as I cannot divide by 5½, I multiply the last quotient by 2, to bring it into *half-yards*, and divide by 11, because there are 11 half-yards in a pole. I find a remainder of 6, which are half-yards, equal to 3 yards. Another way would be to divide the feet at once by 5280, the number of feet in a mile, or the yards by 1760, the number of yards in a mile.

</div>

Ex. 52.—In 85 miles 4 furlongs, how many poles ?

    53.—In 87604 inches, how many yards ?

    54.—Reduce 35 lea. 3 fur. 27 p. 3 yds. 2 ft. 7 in. 2 b. c. into barley-corns.

    55.—How often will the wheel of a railway carriage turn round in going from London to Dover, or in 90 miles, supposing the circumference of the wheel to be 8 feet ?

    56.—Suppose that on an average I step two feet and a half, how many steps shall I take in walking from Brighton to Worthing, a distance of 10 miles ?

LAND OR SQUARE MEASURE.

Ex.—How many yards are there in 2564 acres ?

ac.

  2564

     4

  10256

    40

¼) 410240

    30¼

 12307200

  102560

Ans.. 12409760 yds.

Another way would be to multiply the acres by 4840, the number of yards in an acre.

E

Ex.—In 7623 square feet, how many square rods?

feet.
```
  9) 7623
     ————
      847
        4
        ————
121) 3388 (28 rodsAns.
     242
     ————
      968
      968
     ————
      ...
     ====
```

As we cannot divide by 30¼, I multiply the yards by 4 to bring them into quarters, and then divide by 121, because there are 121 quarters in 30¼ yards. Another way would be to divide the feet by 272¼, the number of feet in a rod. It is usual in practice to omit the ¼, and to divide by the 272 only; but the pupil is requested to employ both methods in the following examples.

Ex. 57.—How many rods are there in 1762 perches?

57. **58.**—In 431 acres of land, how many poles and yards?

59.—In 7865 feet of brickwork, how many rods?

60.—How many perches are there in 687 ac. 2 ro. 20 po.?

61.—In 87643210 inches, how many acres?

62.—In 68750 feet of tiling, how many squares?

63.—How many rods are there in a bowlder wall, which measures 5624 square feet?

64.—A gentleman has 20 acres on his estate, which he wishes to allot to his labourers in shares or parcels of half a rood each, how many allotments will there be?

CUBIC, OR SOLID MEASURE.

Ex.—In 84 solid yards, how many inches?

```
          yds.
           84
           27
          ───
          588
          168
          ────
         2268
         1728
         ─────
        18144
         4536
        15876
         2268
Ans..... 3919104 inches
```

Ex. 65.—How many solid inches are there in 5 tons 18 feet of hewn timber?

66.—In 36871809 solid inches of rough timber, how many loads?

LIQUID MEASURE.

Ex—How many gallons are there in 8 pipes of wine?

```
         pipes.
            8
            2
          ───
           16
           63
          ───
           48
           96
Ans. ..... 1008 gallons.
```

Ex.—In 76894 pints, how many hogsheads?

	pints.	
2)	76894	I divide first by 2, because 2 pints make a quart, then by 4, because 4 quarts make a gallon.
4)	38447	

$$63 \begin{cases} 9) \overline{\quad 9611 - 3} \text{ qts.} \\ 7) \overline{\quad 1067 - 8} \\ \text{hhds. } \overline{\quad 152 - 3} \end{cases} \Big\} 35 \text{ galls.}$$

Here I divide the gallons by 9 and by 7, the component parts of 63, the number of gallons in a hogshead.

Ans. 152 hhds. 35 galls. 3 qts.

Ex. 67.—Reduce 21 hogsheads into quarts.

68.—In 3681 pints, how many gallons?

69.—In 3 tuns, 2 hhds. 51 galls. of claret, how many quarts?

70.—How many pints are there in a puncheon of rum?

71.—In 3608 butts of sherry, how many gallons?

72.—In 303 barrels of ale, how many pints?

73.—In a pipe of port wine, how many gills are there?

DRY MEASURE.

Ex. 74.—In 55 quarters of corn, how many pecks?

75.—How many pints are there in 14 bushels, 2 pecks of canary seed?

76. In 18 loads, 4 bushels, 3 pecks, how many pecks?

77.—In 380016 bushels of oats, how many lasts?

78.—In 280010 bushels of barley, how many quarters?

79.—How many quarters of corn are there in 100,000 gallons?

TIME.

Ex. 80.—In 5 weeks, 2 days, 11 hours, how many hours are there?

81.—Reduce 120 days to hours and minutes.

Ex. 82.—How many minutes, hours, and days are there in 7801608 seconds?

83.—In 5187 days how many months of 28 days each, and years of 365 days each?

84.—How many minutes has a boy lived, who is 12 years and 6 weeks old?

85.—A clock strikes 156 times during the day, how often does it strike in 7 years?

ASTRONOMY.

Ex. 86.—In 126 degrees, how many minutes and seconds?

87.—In 781064 seconds, how many signs?

88.—How many seconds are there in a great circle?

89.—How many minutes are there in 9 s. 8° 46'?

90.—In 37807 minutes, how many degrees?

SIMPLE PROPORTION.

When we have three numbers given, this rule teaches how to find a fourth number, which shall have the same proportion to the third number that the second has to the first.

RULE.

Consider which of the three given numbers is of the same kind with the number to be found, and put it down last in the proportion. Then, if it appear from the nature of the question that the answer will be greater than this number, put the greater of the other two terms in the middle, and the less first; but if the answer ought to be less, put the less in the middle, and the greater first.

Having thus stated the question, reduce the first two terms of the proportion, if necessary, to the same name, and reduce the third term to the lowest denomination it contains.

Then multiply the second and third terms together, and divide the product by the first term, and the quotient will be the answer to the question, in the same denomination that the third term was reduced to; which must be brought again, if necessary, to the highest denomination it admits of, and the answer will then be exhibited in its proper form.

Ex.—If three ounces of gold cost £12 8s. 6½d., what is the value of one pound six ounces?

oz.		lb. oz.		£ s. d.
As 3	:	1 6	::	12 8 6½
		12		20
		‾‾18‾‾		‾‾248‾‾
		11930		12
		‾‾95440‾‾		‾‾2982‾‾
		1193		4
	3)	‾214740‾		‾11930‾
	4)	‾71580‾		
	12)	‾17895‾		
	2,0)	149,1 .. 3d		
		£74 11 3 Ans.		

As the answer is evidently to be in money, I put down the money term in the third place, and as, from the nature of the question, the answer must be more than this third term, I put the 1 lb. 6 oz., that is, the greater weight, in the second place, and the 3 oz. in the first place. I then multiply the second term by 12 to bring it into ounces, that it may be of the same name as the first term, and the third term I reduce into farthings, the lowest denomination it contains. I then multiply the second and third terms together, and divide by the first, which gives 71580 for the answer in farthings, the same denomination that the third term was reduced to. This answer is then brought into its proper form by the rule of Reduction.

Ex.—If 2 cwt. 1 qr. 18 lbs. of raisins cost £5 18s. 6d., what is the value of 10 cwt. 3 qrs. ?

```
    cwt. qr. lb.        cwt. qr.            £   s.  d.
As   2   1   18   :    10   3      ::       5  18   6
     4                  4                   20
    ───                ───                 ───
     9                 43                  118
    28                 28                   12
    ───               ───                 ────
    270               344                 1422
    ═══                86
                     ────
                     1204
                     1422
                     ────
                     2408
                     2408
                     4816
                     1204        12)
                    ─────
              270) 1712088 ( 6341
                   1620       2,0) 52,8 5
                   ────            ──────
                   ..920          £26 8 5
                    810           ══════
                   ────
                   1108
                   1080
                   ────
                   ..288
                    270
                   ────
                   .18 remainder.
                   ════
```

I here multiply the first and second terms by 4 and by 28, to bring them into the same name, namely, pounds; and the third term I reduce into pence, the lowest denomination mentioned. I then proceed as in the previous example.— Had the remainder been larger I should have multiplied it by 4, and have divided by the 270 again for farthings.

Ex. 1.—If 2 lbs. of tea cost 9s., what will 25 lbs. cost ?

2.—If 3 lbs. of coffee cost 3s. 9d., what will 48 lbs. cost ?

3.—If 6 yards of cloth cost £3. 12s. 6d., what will 100 yards cost ?

4.—At 11¼d. per lb., what is the value of a firkin of butter, containing 56 lbs. ?

5.—Bought 2 oz. of tea for 8¾d., what is that per lb. ?

6.—What is the value of 1½ cwt. of coffee at 2½d. per oz.?

Ex. 7.— If I can purchase 24 books for £2 10s., how many can I have for a £10. note ?

8.—If 12 yards of muslin cost 7 guineas, how many ells can I buy for £20. ?

9.—If 18 yards cost £2. 3s. 8d., how much must I give for 1 yd. 2 qr. 3 n. ?

10.—A bankrupt has but £1050 to pay debts to the amount of £3125, how much can he pay in the pound ?

11.—A pole 6 feet high throws a shadow of 5 feet 6 inches, what is the height of a steeple which throws a shadow of 150 feet ?

12.—If 15 reapers can cut down a field of corn in 6 days, in how long time will the same work be performed by 40 men ?

13.—A grocer bought 8 cwt. 1 qr. 20 lbs. of sugar, for which he paid £32. 10s. 6d., at what rate in the pound must he sell it to gain £5 on the whole ?

14.—A ship was provisioned for a crew of 50 men for 3 months, how long would these provisions last, if the crew were reduced to 40 men ?

15.—If 24 pioneers can make a trench in 8 days, what length of time would the same work employ 9 men ?

16.—If 3 cwt. 1 qr. 14 lbs. of sugar cost £12. 17s. 9d., what is the value of 17 cwt. 2 qr. 16 lbs. ?

17.—A tea-dealer bought 4 chests of tea, each weighing 84 lbs. 7 oz., for £76. 16s. 8d., at what rate must he sell it per lb. to gain 25 per cent, that is, one-fourth of the prime cost, on the whole ?

18.—Hops are remarkably cheap, and I have £100 to spare, what quantity can I purchase at £2. 17s. 6d. per cwt. ?

19.—A tradesman who owed me £86. 5s. 6d., became a bankrupt; I received by his dividend £28. 15s. 2d. at what rate in the pound was the dividend made ?

20.—The rent of my house is £25 per annum, and I pay towards the support of the poor £1. 17s. 6d. yearly, at what rate per pound is the assessment made ?

21.—Suppose a gentleman's income is £500 a year, and he spends 20s. 6d. per day, one day with another, how much will he have saved at the year's end ?

22.—What is beef per lb., when a quarter, weighing 24 st. 7½ lb. costs £6. 13s., allowing 8 lbs. to the stone ?

23.—Suppose a person lends me £2. 4s. 6d. for 30 days, and I intend to requite his kindness by lending him £1. 10s., how long ought he to keep it ?

24.—If sugar that cost 8d. per lb. be sold at 3 lb. for 2s. 6d., what is the profit per cent. ?

TARE AND TRET.

1.—Tare and Tret are practical rules for deducting certain allowances made by merchants and tradesmen in selling their goods by weight.

2.—Gross weight is the whole weight of any sort of goods, together with the box, barrel, bag, &c., that contains it.

3.—Tare is an allowance to the buyer for the weight of the package.

4.—Tret is an allowance of 4 lb. in every 104 lb. for waste, dust, &c., or $\frac{1}{26}$ part of the whole, after the tare is deducted.

5.—Cloff is an allowance, after the Tare and Tret are deducted, of 2 lb. upon every 3 cwt., that the weight may hold good when sold by retail.

6.—Suttle is what remains after part of the allowance is deducted from the gross.

7.—Neat weight is what remains after all allowances are made.

1. When the tare is at so much for the whole.

RULE.

From the gross weight subtract the tare, and the remainder will be the neat weight.

E 3

Ex.—What is the neat weight of 17 barrels of indigo, weighing 87 cwt. 3 qr. 18 lbs. gross; allowing 3 cwt. 2 qr. 24 lbs. tare?

```
           cwt. qr. lb.
            87   3  18  gross
             3   2  24  tare
Ans.        84   0  22  neat weight
```

Ex. 1.—What is the neat weight of 38 barrels of figs, weighing 25 cwt. 2 qr. 16 lbs. gross; tare being allowed at 1 cwt. 1 qr. 18 lbs. ?

Ex. 2.—What is the neat weight of 3 hhds. of sugar, weighing as follows, viz:—

No.	cwt. qr. lb.		qr. lb.
1	3 1 16	Tare	0 24
2	5 2 10	....	1 2
3	8 1 14	....	1 15

2.   When the tare is at so much per barrel, chest, &c.

RULE.

Multiply the tare by the number of hogsheads, barrels, chests, &c., subtract the product from the gross, and the remainder will be the neat weight.

Ex.—What is the neat weight of 3 hogsheads of sugar, each weighing 12 cwt. 1 qr. 4 lbs.; the tare being 1 qr. 8 lbs. per hhd.?

```
       cwt. qr. lb.          qr.  lb.
        12   1   4            1    8
                 3                 3
       ─────────────        ──────────
        36   3  12  gross    3   24  tare
         3  24  tare         ──────────
       ─────────────
Ans.    35   3  16  neat weight.
```

Ex. 3.—What is the neat weight of 9 chests of tea, each weighing 2 qrs. 19 lbs.; tare 16 lbs. per chest ?

4.—What is the neat weight of 65 bales of silk, each weighing 268 lbs. gross; tare 15 lbs. per bale ?

3. When the tare is at so much per cwt.

RULE.

Take the aliquot part or parts of the whole gross weight that the tare is of a cwt., as in Practice, and subtract the result from the gross weight.

Ex.—What is the neat weight of 5 hhds. of tobacco, each weighing 3 cwt. 1 qr. 25 lbs.; tare 21 lbs. per cwt.?

```
              cwt. qr. lb.
               3   1  25
                          5
lb.    
    14 | ⅕ | 17  1  13 gross          In working with the remainders
     7 | ⅓ |  2  0  19                below pounds, the nearest ¼, ½,
       | ½ |  1  0   9½               or ¾ pound has been taken in
              3   1   0½ tare         every instance.
   Ans. 14  0  12½ neat weight
```

Ex. 5.—Required the neat weight of 30 casks of butter, weighing 16 cwt. 3 qr. 20 lbs.; tare 14 lbs. per cwt.

Ex. 6.—What is the neat weight of 18 barrels of anchovies, each weighing 1 qr. 21 lbs.; tare being 10 lbs. per cwt.?

4.—When both tare and tret are allowed.

RULE.

Find the tare as in the foregoing rules; subtract it from the gross weight, the remainder, or suttle, divided by 26, gives the tret, which, being subtracted from the suttle, gives the answer.

Ex.—What is the neat weight of 12 casks of tallow, each weighing 4 cwt. 3 qr. 12 lbs.; tare being 16 lb. per cwt., and tret as usual.?

```
             cwt. qr. lb.
              4   3  12
                         12
lb.   
   16 | ⅐ | 58  1   4  gross          Here, in dividing by 7, the re-
            8  1   8½ tare            mainder after pounds is 4, which
       26)49  3  23½ suttle           I multiply by 4, to bring it into
            1  3  19  tret            quarters, and the product is 16;
     Ans. 48  0   4½ neat weight      this I divide by the 7, and the
                                      result is 2, which I put down as ½
                                      lb., and disregard the remainder.
```

Ex. 7.—In 12 casks of raisins, each 2 cwt. 2 qr. 18 lbs. gross; tare 18 lbs. per cwt.; and tret as usual, what is the neat weight?

8.—What is the neat weight of 186 cwt. 1 qr. 13 lbs. gross, tare 10 lbs. per cwt.; and tret as usual?

5.—When tare, tret, and cloff are allowed.

RULE.

Subtract the tare from the gross, and the tret from the tare suttle, the remainder will be the tret suttle; then divide this tret suttle by 168, and the result will be the cloff, which, being subtracted from the tret suttle, gives the neat weight required.

Ex.—Gross weight 16 cwt. 18 lb.; tare 12 lb. per cwt.; tret as allowed; cloff as allowed; what is the neat weight?

$$
\begin{array}{c|c|rrrl}
\text{lb.} & & \text{cwt.} & \text{qr.} & \text{lb.} & \\
8 & \frac{1}{14} & 16 & 0 & 18 & \text{gross} \\
4 & \frac{1}{2} & 1 & 0 & 17\frac{1}{2} & \\
 & & & 2 & 8\frac{1}{2} & \\
\hline
 & & 1 & 2 & 25\frac{3}{4} & \text{tare} \\
 & 26) & 14 & 1 & 20\frac{1}{4} & \text{tare suttle} \\
 & & & 2 & 6 & \text{tret} \\
\hline
 & 168) & 13 & 3 & 14\frac{1}{4} & \text{tret suttle} \\
 & & & & 9\frac{1}{4} & \text{cloff} \\
\hline
\text{Ans.} & & 13 & 3 & 5 & \text{neat weight}
\end{array}
$$

Ex. 9.—What is the neat weight of 24 hhds., weighing gross 58 cwt. 1 qr. 12 lbs; tare 2 qrs. 16 lbs per hhd; tret and cloff as usual?

Ex. 10.—In 9 hhds. of tobacco, each weighing 5 cwt. 24 lbs. gross, tare 11 lbs. per cwt.; and tret and cloff as allowed, what is the neat weight?

Ex. 11.—What is the value of the neat weight of 5 casks of currants, each weighing 3½ cwt. gross, at £3. 18s. 6d. per cwt., allowing 8 lbs. per cwt. for tare, and tret and cloff as usual?

SIMPLE INTEREST.

Interest is money paid for the loan of money.

The principal is the money lent.

The rate is the sum per cent. agreed on.

The amount is the principal and interest added together.

Thus, if I get from a banker £100, at 5 per cent., I must pay him back, at the end of the year, the principal, viz. £100, and the interest viz. £5. The principal and interest, viz. the £105 that I pay, is the amount.

1.—To find the interest for years, &c.

RULE.

1.—Multiply the principal by the rate per cent., and divide the product by 100 ; the quotient is the interest for one year.

2.—Multiply the interest for one year, by the number of years given, and the product is the interest for that time.

3.—If there be any months, or fractional parts of a year, they must be worked for by the aliquot parts of a year, as in Practice.

Ex.—What is the interest of £655 10s. for 3 years and 8 months, at 5 per cent. per annum ?

£.	s.		mo.		£	s.	d.	
655	10		6	½	32	15	6	=interest for 1 year
	5						3	
32,77	10				98	6	6	=interest for 3 years
20			2	⅓	16	7	9	= do. for 6 months
15,50					5	9	3	=do. for 2 months
12				Ans.	120	3	6	=interest for 3 years
6,00								[and 8 months

Here I multiply the interest for one year by 3, for the number of years, and take parts for the 8 months, by saying 6 months is the half, and 2 months is the third of that, as in Practice.

Ex 1.—What is the interest of £150 for 1 year, at 5 per
     cent. per annum ?

  2.—Required the interest of £260 for 2 years, at 5
     per cent. per annum.

  3.—What is the interest of £765 10s. for 1 year, at
     4 per cent. per annum ?

  4.—Find the interest of £971 15s. 6d. for one year,
     at 3 per cent. per annum.

  5.—Required the interest of £439 10s. 6d. for 5
     years, at 3 per cent. per annum.

  6.—What is the interest of £320 17s. for 3 years, at
     4 per cent. per annum ?

  7.—Required the interest of £425 12s. 6d. for $2\frac{1}{2}$
     years, at 5 per cent. per annum.

  8.—Find the interest of £849 7s. 10d. for 2 years, at
     $3\frac{1}{2}$ per cent. per annum.

  9.—What is the amount of £300 for $3\frac{1}{2}$ years, at 4
     per cent. per annum?

 10.—What is the interest of £1000 for a quarter of a
     year, at 5 per cent. per annum ?

 11.—Required the interest of £700 for half a year, at
     5 per cent.

 12.—Find the interest of £1250 for 9 months, at 5 per
     cent.

 13.—Find the interest of £737 10s. for a year and
     three quarters, at 4 per cent.

 14.—Find the interest of £554 10s. for two years and
     4 months, at 3 per cent.

 15.—Required the interest of £750 10s. for $3\frac{1}{2}$ years,
     at $4\frac{1}{2}$ per cent.

 16.—Required the interest of £379 16s. for $8\frac{1}{2}$ years,
     at $3\frac{1}{2}$ per cent.

17.—Required the interest of £2780 14s. for 2 years and 8 months, at 3 per cent.

18.—What is the amount of £3475 18s. for 7 years, at 2½ per cent. ?

19.—Required the interest of £38 19s. 6d. for 4 years and 4 months, at 3 per cent. per annum.

20.—What shall I have to receive for the loan of £230, for 4 months, at the rate of 3¼ per cent. per annum ?

21.—What is the amount of 300 guineas for 4 years and seven months, at 3½ per cent. ?

22.—How much shall I have to receive at the end of 7 years for £250, supposing 4½ per cent. be allowed as interest ?

2.—To find the interest for days.

RULE.

1.—Multiply the principal by the number of days, and divide the product by 7300, the quotient is the interest, at 5 per cent. which may be reduced to any other rate by taking aliquot parts.

2.—For any rate per cent.: multiply by the days, and by *double the rate;* and divide by 73000.

NOTE.—When there are years and days given, find for the years by the rule for years, and for the days by the rule for days; and add the two results together for the answer.

For 5 per cent.

Ex.—What is the interest of £114 1s. 3d. for 81 days, at 5 per cent.?

```
              £    s.  d.
            114    1   3
                          9 × 9 = 81 days
            ─────────────
           1026   11   3
                       9
            ─────────────
    7300) 9239   1   3 (£1 5s. 3¾d. = 5 per cent. =
          7300                            Ans.
          ─────
          1939
            20
          ─────
    7300) 38781 (5s.
          36500
          ─────
           .2281
             12
    7300) 27375 (3d.
          21900
          ─────
           .5475
              4
    7300) 21900 (¾
          21900
          ─────
          . . . . .
          ═════
```

Another way would be to find the interest of the given sum at the given rate per cent. for one year; and then say, as 365 : 81 :: that interest to the answer required by the rule of Proportion.

Any other rate per cent. may be found by tabulating thus:

```
                       £    s.   d.
         Divide by 5) 1    5   3¾
                      ─────────────
                       5   0¾ = 1 per cent.
           Add..       5   0¾
                      ─────────────
                      10   1½ = 2 per cent.
           Add..       5   0¾
                      ─────────────
                      15   2¼ = 3 per cent.
           Add..       5   0¾
                      ─────────────
                    1  0   3  = 4 per cent.
           Add..       5   0¾
                      ─────────────
                    1  5   3¾ = 5 per cent.
```

Had halves and quarters per cent. been required, I should have divided by 20 instead of by 5, and continued adding together the $\frac{1}{20}$ instead of the $\frac{1}{5}$, as far as was necessary.

For any rate per cent.*

Ex.—What is the interest of £114 1s. 3d. for 81 days, at 4 per cent. ?

```
                £    s.   d.
               114   1    3
                          9 × 9 = 81 days
              ─────────────
              1026  11    3
                          9
              ─────────────
              9239   1    3
                          8 = double rate
    73000)73912   10    0(£1 0s. 3d. = 4 per cent. =
          73000                              Ans.
         ───────
          ..912
             20
    73000)18250(0s.
             12
    73000)219000(3d.
          219000
         ───────
          ......
         ═══════
```

Ex. 23.—What is the interest of £38 0s. 5d. for 27 days, at 5 per cent. per annum ?

24.—What is the interest of £408 10s. for 30 days, at 5 per cent.?

25.—What is the interest of £584 10s. for 42 days, at 5 per cent.?

26.—Find the interest of £342 3s. 9d. for 81 days, at 5 per cent.

27.—Find the interest of £100 for 73 days, at 5 per cent.

28.—Find the interest of £1000 for 146 days, at 5 per cent.

---

* This method will be found generally preferable for the young student, for any rate other than 5 per cent., as by it the fractions, which may occur in dividing, will be avoided.

Ex. 29.—Find the interest of £228 2s. 6d. for 11 weeks and 4 days, at 5 per cent.*

 30.—Find the interest of £426 for 6 weeks and 4 days, at 5 per cent.

 31.—Find the interest of £1260 10s. 6d. for 120 days, at 5 per cent.

 32.—Find the interest of £764 16s. for 9 weeks and 3 days, at 5 per cent.

 33.—Required the interest of £76 0s. 10d for 1 day, at 5 per cent.

 34.—Required the interest of £513 5s. 7½d. for 162 days, at 5 per cent.

 35.—What is the interest of £250 for 45 days, at 4 per cent. per annum?

 36.—What is the interest of £155 10s. for 49 days, at 3 per cent. per annum?

 37.—What is the interest of £624 17s. 6d. for 14 days, at 4½ per cent. per annum ?

 38.—What is the interest of £2745 7s. 6d. for 3 weeks, at 2½ per cent. per annum ?

 39.—What is the interest of £4725 10s. for 3 years and 136 days, at 3 per cent. per annum?

 40.—Required the amount of £590 15s. 6d. for 2 years and 36 days, at 3½ per cent. per annum.

 41.—Required the amount of £10710 18s. 4d. for 9 years and 12 days, at 3¾ per cent. per annum.

 42.—How much do I lose by suffering £270 to lie at my banker's 55 days, instead of laying it out in Exchequer Bills or India Bonds, which yield 5 per cent. per annum ?

---

* When the time is given in weeks, reduce them to days, and proceed as before.

COMMISSION, BROKERAGE, INSURANCE, AND BUYING AND SELLING OF STOCK.

Commission is an allowance of so much per cent. to an agent or factor, for buying or selling goods, negotiating bills, &c.

Brokerage is an allowance to a broker for procuring sales, transfers of property, &c.

Insurance is an allowance, called premium, given to persons who engage to make good the loss of ships, merchandize, houses, &c., that may be lost or damaged by storms, fire, &c.

Stock is the debt owing by government, or it is the capital of any trading company.

All questions in these rules are performed by the rules for Simple Interest.

Ex.—What is the commission on £320 16s. at 2½ per cent.?

```
              £      s.
      ½) 320   16
                     2½
             ─────────
             641   12
             160    8
  1,00) 8,02   0        I multiply by the rate per
             20         cent., and divide by 100, as
           ─────        in Simple Interest.
            , 40
             12
           ─────
           4,80
              4
           ─────
           3,20
           ═════
```

Ans. £8 0s. 4¾d.

Ex.—What is the brokerage on £820 10s., at 5s. or ¼ per cent.?

```
              £     s.
 ¼)  820    10
     2,05     2   6
      20
     1,02
      12
      30
       4
     1,20
```

Ans. £2 1s. 0¼d.

Ex.—What is the insurance on £716 18s., at 7½ per cent.?

```
              £     s.
 ½)   716    18
               7½
     5018     6
      358     9
     53,76   15
      20
     15,35
      12
      4,20
```

Ans. £53 15s. 4d.

Ex.—What is the purchase of £420 bank stock, at 110¼ per cent.?

```
              £
 ¼)  420
     110¼
     46200
       105
     463,05
        20
      1,00
```

Ans. £463 1s.

Ex. 1.—What is the commission on £520, at ¼ per cent. ?

2.—What is the commission on £876, at 1½ per cent.?

3.—What is the brokerage on £5810, at ⅝ per cent. ?

4.—What must I allow my correspondent for disbursing on my account £786 18s., at 2¼ per cent. ?

5.—If I allow my factor 7⅛ per cent. for commission, what may he demand on his laying out £1200?

6.—I employed an agent to sell a quantity of goods, having agreed to give him 7s. 6d., or ⅝ per cent. upon the sales; the goods having sold for £5164, how much am I to pay him ?

7.—What premium must be paid for insuring a house for £1000, at 5s. per cent. ?

8.—An agent charges 4½ per cent. for commission and risk of bad debts; his sales in the year are £18670, and his losses £276, what is his income?

9.—What is the insurance of an East India ship and cargo, valued at £30817 12s. 6d., at 6 guineas per cent. ?*

10.—My factor buys sugar at £3 10s. per cwt., what does it cost me, including his commission, at 17s. 6d., or ⅞ per cent. ?

11.—What is the insurance of £700, at 10¾d. per cent. ?

12.—A bookseller in London allows his agent in America 5 per cent. commission, what does he pay him for the remittance of £3870 18s. 9d.?

13.—What will the insurance of £1800 come to, from Bremen to London, at 4 guineas per cent. ?

14.—What will £300 in the 3 per cent. consols. cost, at 61½ per cent., allowing the usual brokerage of ⅛ per cent. ?†

* When the rate is in guineas, calculate as if it were pounds, and add one twentieth to the amount.

† The brokerage is 2s. 6d. (or ⅛) per cent. on the capital purchased; on terminable annuities it is 2s. 6d. per cent. on the sum laid out.

I intend giving in this note the price of stocks for one day; and an explanation, so as to render the information on this head, contained in the papers, intelligible to the younger reader.

15.—What is the purchase of £540 16s. bank stock, at 112⅛ per cent. ?

16.—What will £180, 4 per cent. annuities cost, at 75¾ per cent. ?

17.—What will £50 per annum long annuities cost, at 15¼ years purchase ?

Price of Stocks, Oct. 21.

Bank Stock	201	Bank Long Ann. ......12 12$\frac{1}{16}$	
India Stock		Omnium	1¼ pre.
3 per Cent. Cons.	61½ ⅝ ¾	India Bonds	2s. dis.
4 per Cent. Cons.	82¼ 81¾	Ex. Bills	1s. dis. 1s. pre.
5 per Cent. Navy	96⅜ 97	Cons. for Oct. 26	61¼

1. Bank Stock, 201; that is, £201 must be given on that day to purchase £100 of that stock; the annual interest of this is about 10 or 11 per cent.

2. India Stock; none of this stock was sold on this day.

3. 3 per Cent. Consols. 61½ ⅝ ¾. The price of this stock fluctuated in the course of the day; it began at £61½, or £61 10s.; it rose to £61⅝, or £61 12s. 6d.; and when the market, as it is called, closed, the value of £100 in the 3 per cent. consolidated was £61¾, or £61 15s.

4. 4 per Cent. Consols. and 5 per Cent. Navy, as well as 3 per Cent. Reduced, and 3 per Cent. Imp. will be understood from what has been said.

5. Bank Long Ann. 12 to 12$\frac{1}{16}$. This refers to certain annuities granted for a term of years; the market price of which, on this day, was from 12 to 12$\frac{1}{16}$ years; that is, if I wish to purchase £100 per annum of these annuities, I must, at the lower price, pay £100 × 12, or £1200; and at the higher, £100 × 12$\frac{1}{16}$, or £1206 5s.; and for this £1200 or £1206 5s. I should be entitled to the £100 per annum for about 16 years, the time when these annuities *terminate*. Hence these are called *terminable* annuities.

6. Omnium 1¼ pre. This is a word that refers to the several sorts of stocks in which a new loan is made: for instance, if government borrow twenty millions, and give to each lender, for every £100 so purchased, £100, 3 per Cent. Consols. £50 in the Reduced, and the rest in Long Annuities, then this stock, the moment it is subscribed, is saleable; and while the different articles are sold together, it is styled *omnium ;* and 1¼ premium means, that a person, to purchase £100 of this loan, must pay 1¼, or £1 10s. *more* than the original lender; had it been 1½ discount, then the purchase would have been £1 10s. *less* than the original cost, or £98 10s.

7. India Bonds, 2s. dis.; this phrase shows that the bonds of £100, given by the East India Company, are at 2s. each discount; that is, to purchase 5 of these, I must pay £499 10s. instead of £500.

18.—What does £3500 capital stock in the 3 per cent. consolidated bank annuities come to, at 90⅜ per cent. ?

19.—What is the purchase of £879 17s. 6d. navy 5 per cents. at 84¾ per cent. allowing brokerage at ⅛ per cent. ?

20.—What is the difference on £1500 3 per cent. consols, bought at 64⅞, and sold at 65⅜ per cent. ?

DISCOUNT.

Discount is an allowance made for the payment of any sum of money before it becomes due, according to a certain rate per cent.

The present worth of any sum or debt, due some time hence, is such a sum as, if put out to interest for the time and rate, would amount to the sum or debt then due.

DISCOUNT PROPER.

RULE.

As the Amount of £100 for the given rate and time is to the interest of £100 for that time, so is the given sum to the discount required. The difference between this discount and the given sum will give the present value.

---

8. Ex. Bills, 1s. dis. 1s. pre., shows that Exchequer Bills, of £100 each, fluctuated in value from 1s. discount to 1s. premium : at one part of the day 10 of them would have been purchased for 10 shillings less than £1000, and, at the close of the market, 10 shillings more than £1000 must have been given for them. It may be observed, that India Bonds and Exchequer Bills are convenient stocks to lay money out in, because they may be sold at any time, and the rise and fall are seldom more than a few shillings per cent.

9. Consols. for Oct. 26 shows that some persons had bought stock in anticipation, and had agreed to give for it, on the day mentioned, at the rate of £61 10s. per cent.

Ex.—What is the discount of £500 for 9 months, at 5 per cent. per annum ?

```
mo.        £
 6 | ½ |  5
 3 | ½ |  2  10
        1   5
        3  15                    £            £
   As 103  15    :  3  15  ::  500
         20          20             20
       2075          75          10000
                   10000   2,0) ————
           2075) 750000  ( 36,1
                 6225        £18  1  5¼ = Ans.
                 ————
                 12750
                 12450
                 ..3000
                   2075
                   ————
                  .925
                   12
           2075) 11100  ( 5
                 10375
                 ..725
                   4
           2075) 2900  ( ¼
                 2075
                 ————
                 .825  =  11/83
                 ————
                 2075
```

```
     £   s. . d.
    500  0   0
     18  1   5¼  = the discount.
    ————————————
   £481 18   6¾  = the present worth.
```

Ex. 1.—What is the discount of a bill of exchange for £100, due one year hence, at 5 per cent.?

2.—What is the discount of £80, payable 3 months hence, at 5 per cent. per annum?

3.—What is the difference between the discount on a bill of exchange for £1000, payable 1 year hence, and the interest on the same at 5 per cent.?

4.—What is the discount on £725 15s. 6d. for 2 months at 5 per cent.?

5.—Sold goods to the value of £215 19s., payable 6 months hence, what must I allow for present payment, at 7½ per cent. per annum?

6.—What is the present worth of £60, payable 15 months hence, at 5 per cent.?

7.—What is the discount on £75, due October the 26th, this being July the 2nd, at 3 per cent. per annum?

2. CUSTOMARY DISCOUNT.

1.—To find the discount of any sum of money for any number of months.

RULE.

Calculate at the rate of one penny per pound per month.*

When no time is specified, the interest of the value of the goods for a year is the discount.

NOTE.

* This is at the rate of 5 per cent. per annum, the legal *interest* of the country; for, if 100 pounds yield 100 shillings in a year, one pound will yield one shilling in a year, or one penny per calendar month.

The Rule of Discount is, in fact, the same as that of Simple Interest, but the Rule given in the text is that which is in general use, and admitted by custom, and in practice, though it is at a rate somewhat higher than 5 per cent.

F

When time is specified, and the Rule cannot be conveniently employed, calculate as in interest.

Ex.—I have just received two bills of £50 each, the one is payable at two months, and the other at three; how much must I pay for having them discounted?

$$
\begin{array}{llll}
& \pounds & \text{d.} & \pounds \quad \text{s.} \quad \text{d.} \\
\text{Discount of 50 for 2 months} & = 50 \times 2 = & 0 \quad 8 \quad 4 \\
\text{—} \quad\quad 50 —3 \quad\quad \text{—} & = 50 \times 3 = & 0 \quad 12 \quad 6 \\
\end{array}
$$

Ans. £1   0 10

Ex. 8.—I have just sent to my banker's a bill of £120, payable at 4 months, what must I pay for having it discounted?

9.—What will be the discount upon £245 at 5 per cent.?

10.—What must be discounted in paying £376 18s. 4d. 6 months before it is due, discount being at 5 per cent. per annum?

11.—If I lay out £87 10s. in cotton, and am to be allowed 5 per cent. discount for ready money, what shall I save by paying for it when I receive it?

Perfect accuracy would require us to find the *present worth* of the bill or bills to be discounted. It is, however, on *true principles*, that is, according to the Rule of Discount Proper, that Smart's Tables are calculated, and those are chiefly in use by persons in the habit of discounting bills.

When the sum is small and the time short, the difference between these two modes of calculation is but trifling; but when the sum is large, and the time long, it is an object deserving of attention.

Ex.—Suppose I have a bill of £1000, payable 2 years hence, then by the Rule in the text, I must pay £100 for having the same discounted; but, by the first Rule, I say—

$$
\begin{array}{lll}
\pounds & \pounds & \pounds \\
\text{As 110} \quad : & 10 \quad :: & 1000 \\
& 1000 & \\
\end{array}
$$

110) 10000 (90 18 2   £ s. d.

which is the true discount, and makes a difference of 9 1 10

Ex. 12.—If I buy furniture to the amount of £476 16s. 8d., what ready money will pay for it, discount being at 8 per cent?

13.—How much ready money will discharge a debt of £75, due 9 months hence, discount being at 7½ per cent. per annum?

14.—How much discount ought I to receive on paying a debt of £437 18s., due 4 months hence, discount being allowed at 5 per cent. per annum?

15.—Suppose I give my bookseller an order to the amount of £40 15s. 6d., and he is willing to allow me 6 months credit, but I prefer paying him cash; what shall I have to pay him, the discount being at 7½ per cent?

16.—I have in my possession the following bills, which I wish to get discounted; what shall I have to pay the person who will give me cash for them?

	£	s.			
A bill of	325	10	due 2	months hence.
A do.	38	10	— 4	ditto
A do.	470	0	— 3	ditto
A do.	59	10	— 6	ditto

2.—To find the discount for a sum of money for any number of days.

RULE.

Multiply the number of pounds by the number of days, and divide by 365, the answer is in shillings, because the interest of one pound is one shilling for a year.

Note.—When the principal is in pounds, shillings, pence, &c., and not in even pounds, the Rule for finding the *interest* for days must be used, page 87.

Ex.—What is the discount for £100 for 14 days?

$$
\begin{array}{r}
£\\
100\\
14\\
\hline
\end{array}
$$

$$365) \; 1400 \; (3 \quad 10\tfrac{2}{73} \text{ Ans.}$$
$$\underline{1095}$$
$$.305$$
$$\underline{\;\;12}$$

$$365) \; 3660 \; (10$$
$$\underline{365}$$
$$.\,.\,10 = \tfrac{2}{73}$$
$$\overline{365}$$

Ex. 17.—What is the discount of £200 for 28 days?

18.—On the first of August I went to get a draft of £50 cashed, due, including the 3 days of grace, on the 17th of the same month, what did I pay for discount?

19.—How much must I pay for having the following bills discounted, viz.,—£100 at 21 days; £185 at 35 days : £781 at 58 days ; £77 at 130 days?

20.—How much ought I to pay for discount on the six following bills of £150 each, at 2 months and 4 months, 3 weeks and 6 weeks, 50 days and 55 days?

PARTNERSHIP.

Partnership is a Rule by which merchants trading in company with a joint stock, are enabled to ascertain each person's particular share of the gain or loss, in proportion to his share in the stock.*

---

* This Rule is of great use in various concerns; by it a bankrupt's estate may be accurately divided among his creditors. Legacies are also adjusted by it, when there is not money enough left to answer all the demands of the legatees.

This Rule is divided into two parts, viz.—

1, Partnership for equal time; and 2, Partnership for unequal times.

1. Partnership for any equal time.

RULE.

As the whole stock is to the whole gain or loss, so is each man's share in the stock to his share of the gain or loss.

Ex. Two persons, A and B trade together; A puts into the stock £300 and B £400; and they gain in the first year £182; what is each person's share of the profit?

$$
\begin{array}{r}
£ \\
300 \\
400 \\
\hline
700 \\
\hline
\end{array}
$$

As £700 : £182 :: £300

$$
\begin{array}{r}
300 \\
\hline
7,00)546,00 \\
\hline
£78 \quad \text{A.'s share.} \\
\hline
\end{array}
$$

As £700 : £182 :: £400

$$
\begin{array}{r}
400 \\
\hline
7,00)728,00 \\
\hline
£104 \quad \text{B.'s share.} \\
\hline
\end{array}
$$

$$
\begin{array}{ll}
£ & \\
78 & \text{A.'s share.} \\
104 & \text{B.'s share.} \\
\hline
£182 & \text{The proof.} \\
\hline
\end{array}
$$

1.—Two persons trade together, the one puts in as
       capital £500, and the other £600 ; and they
       gain in the first year £100, what is each person's
       share of the gain ?

2.—Four persons in partnership. A, B, C, and D,
       put into stock £180, £240, £350, and £430
       respectively for three years certain, and at the
       end of that time they find they have gained
       £1500; what is each person's share of the gain ?

3.—Divide £120 between three persons, so that their
       shares shall be to each other as 1, 2, and 3
       respectively.

4.—Three merchants freighted a ship to America ; the
       value of the cargo was £2640 ; of this £540
       belonged to A, £1200 to B, and the rest to
       C ; they lost upon the whole cargo £624 ;
       what is each merchant's share of the loss ?

5—Three wine merchants freighted a ship with 678
       pipes of wine, of which 170 pipes belonged to
       A, 208 to B, and the rest to C. During a
       storm, the sailors were obliged to throw 84 pipes
       overboard ; what was the loss sustained by
       each ?

6.—A person dying bequeathed to three relatives
       £800, £620, and £540 respectively ; but after
       paying the testator's just debts, the executors
       found that there was not sufficient remaining
       by £120 to satisfy these claims upon the estate ;
       what then must each legatee receive in con-
       sequence of the altered circumstances of the
       case ?

2. Partnership for unequal times.

Rule.

Multiply each man's stock by the time of its continuance,
and proceed as in the previous rule.

Ex. Three persons enter into partnership; A puts in £200 for four months; B £400 for six months; and C £500 for eight months. They gain £300; what is each person's share of the gain?

$$
\begin{array}{rcrcr}
200 & \times & 4 & = & 800 \\
400 & \times & 6 & = & 2400 \\
500 & \times & 8 & = & 4000 \\
\hline
& & & & 7200 \\
\end{array}
$$

As 7200   :   300   ::   800
              800   £ s. d.
   72,00)2400,00 (33 6 8 = A's share.
          216
         ̄ ̄ ̄ ̄
          .240
          216
         ̄ ̄ ̄ ̄
          .24
           20
         ̄ ̄ ̄ ̄
        72)480(6
           432
          ̄ ̄ ̄ ̄
          .48
           12
          ̄ ̄ ̄ ̄
        72)576(8
           576
          ̄ ̄ ̄ ̄
           . . .
          ═══

As 7200   :   300   ::   2400
              2400   £
   72,00)7200,00(100 = B's share.
          72
         ̄ ̄ ̄ ̄
          . .00
          ═══

$$
\begin{array}{ccc}
£ & £ & £ \\
\text{As } 7200 & : & 300 & :: & 4000
\end{array}
$$

$$
\begin{array}{c}
4000 \\
\hline
\end{array}
$$

£ s. d.

72,00)12000,00 (166 13 4 C's share.

```
72,00)12000,00 (166 13 4  C's share.
        72
       ───
        480
        432
       ────
        .480
        432
       ────
        .48
        20
       ───
    72)960(13
        72
       ───
        240
        216
       ───
        .24
        12
       ───
    72)288(4
        288
       ───
        ...
       ═══
```

£	s.	d.		
33	6	8	=	A's share.
100	0	0	=	B's share.
166	13	4	=	C's share.
300	0	0	=	Proof.

Ex. 7—Two persons enter into business : A puts in £760, and B £820 ; A's money was in the business two years and B's three years : they gained £900 ; how ought the gain to be divided ?

8.—Three graziers rented a piece of land for £126 ; A put six cows on the land for eight months, B ten cows for four months, and C fifteen cows for six months ; how much ought each to pay of the rent ?

9.—A, B, C, and D put each into partnership £500 ; A's money remains five months, B's seven months, C's nine months, and D's a year : they gain £750 ; what is each person's share of the gain ?

DUODECIMALS.

Duodecimals, or Cross Multiplication, is a rule made use of by workmen and artificers in measuring their work. The dimensions are generally taken in feet, inches, and parts. The foot is divided into twelve parts called inches; the inch into twelve parts called seconds; the seconds into twelve parts called thirds; and the thirds into twelve parts called fourths. The seconds are marked thus, 3″; thirds, thus 3‴; and fourths, thus 3⁗. Different measures are used by different artificers; viz.—

Glaziers, masons, and others, measure by the square foot.

Painters, pavers, plasterers, &c., by the square yard.

Slating, tiling, flooring, &c., by the square of 100 feet.

Brickwork is measured by the rod of 16½ feet, the square of which is 272¼.

Note.—Bricklayers always value their work at the rate of a brick and a half thick; if the wall be more or less, it must be reduced to that thickness, by the following rule :—" Multiply the measure found by the number of half bricks, and divide by three :" thus, if the wall be 2½ bricks thick, I multiply by 5 and divide the product by 3.

Rule.

(1.) Arrange the terms of the multiplier under the same denominations of the multiplicand. (2.) Multiply each term in the multiplicand, beginning at the lowest, by the feet in the multiplier, and write the result of each under its respective term, observing to carry one for every twelve. (3.) Multiply in the same manner, by the inches, and set the result of each term one place removed to the right-hand of those in the multiplicand. (4.) Multiply then by the seconds, setting the result of each term two places removed to the right-hand of those in the multiplicand.

Ex.—Multiply 7 feet 6 in. 9 seconds by 2 feet, 5 inches, 3 seconds.

	ft.	in.	″			
	7	6	9			
	2	5	3			
	15	1	6			
	3	1	9	9‴		
		1	10	8	3‴‴	
Feet	18	5	2″	5‴	3‴‴	

I multiply by 2, saying, twice 9 are 18, 6 and carry 1, twice 6 are 12, and 1 are 13, 1 and carry 1, twice 7 are 14, and 1 are 15. For the second line I say, 5 times 9 are 45, 9 and carry 3, but the 9 over are thirds; and so of the rest.

Ex. 1.—Multiply 8 ft. 6 inches by 6 feet 5 in.

2.—Multiply 10 ft. 4 in. 6 sec., by 8 ft. 6 in. 9 sec.

3.—Multiply 12 ft. 10 in. 8 sec. by 6 ft. 4 in. 9 sec.

4.—Multiply 46 ft. 11 in 10 sec. by 10 ft. 9 in. 8 sec.

5.—Multiply 7 ft. 4 in. by 3 ft. 6 in.

6.—Multiply 11 in. by 11 in.

7.—Multiply 1 ft. 10 in. by 10 in.

8.—Multiply 6 ft. 7 in. 4 sec. by 1 ft. 2 in. 3 sec.

9.—Multiply 346 ft. 6 in. 7 sec. by 296 ft. 4 in. 9 sec.

10.—Multiply 1569 ft. 3 in. by 467 ft. 9 in.

To find the superficial content, multiply the length by the breadth.

Ex. 11.—Find the content of a board 8 feet 6 inches long and 2 feet 4 inches broad.

12.—Find the area of a table 12 feet 9 inches long and 3 feet 4 inches broad.

13.—What is the price of a marble slab, 7 feet 4 inches long and 2 feet 2 inches broad, at the rate of 6s. per square foot?

14.—Required the area of a square, the side of it being 21 feet 8 inches.

Ex. 15.—How much will the paving of a racket-court cost, at 1s. 2d. per foot, the court being 45 feet long and 33 feet 6 inches wide.

16.—How much shall I have to pay for slating the roof of a house, consisting of two sloping sides, each measuring 26 ft. 8 in. by 14 ft. 6 in. at the rate of 35s. per square of 100 feet?

17.—How many square rods are there in a brick wall 55 ft. 6 in. long and 6 ft. 4 in. high, and $2\frac{1}{2}$ bricks thick?

18.—Suppose a garden wall measures 678 ft. round, and is 9 ft. 6 in. high and $2\frac{1}{2}$ bricks thick, what was the expense of building it at £5 6s. per square rod?

To find the solid content, multiply the length, breadth, and thickness together.

Ex. 19.—What is the solid content of a block of marble, 8 feet 6 inches long, 4 feet 9 inches broad, and 2 feet 3 inches thick?

20.—A log of mahogany is 84 feet $4\frac{1}{2}$ inches long, 6 feet $8\frac{1}{4}$ inches broad, and 5 feet $3\frac{1}{2}$ inches thick. Required its solid content.

21.—If a piece of timber be 9 inches square at the end, and 15 feet 6 inches long, how many solid feet does it contain?

22.—A cellar is to be dug, 24 feet 6 inches in length, 12 feet 8 inches in breadth, and 9 feet 4 inches in depth, how many solid feet of earth will be dug out, and what will it cost digging, at 6d. per solid yard?

23.—Required the solid content of a log of beech, 31 feet 9 inches long, 4 feet 3 inches broad, and 2 feet 6 inches thick.

24.—What is the value of a block of granite, 7 feet 9 inches long, 3 feet 8 inches broad, and 4 feet 7 inches thick, at 3s. 6d. the solid foot?

BILLS OF BOOK DEBTS.

A Bill of Book Debts is a statement of debts previously contracted. The following is the manner in which it ought to be copied from the tradesman's books.

WINE MERCHANT'S BILL.

(1)   WORTHING, *Christmas*, 1845.
  MATTHEW STANFORD, Esq.
                         To PLUMER AND ROBERTS.

1845.				£	s.	d.
May 16.—To 3 dozen Port	at 44/ per doz.					
25.—	2½ —	Sherry	– 42/ —			
June 18.—	4 —	Claret	– 64/ —			
Sept. 3.—	2 —	Burgundy	– 72/ —			
20.—	1 —	Champagne	– 84/ —			
Oct. 19.—	9 galls.	Brandy	– 32/ per gall.			
26.—	4 —	Hollands	– 26/ —			
Dec. 18.—	2 —	fine old Rum	– 16/ —			
			£			

LINEN DRAPER'S BILL.

(2)   GUILDFORD, *Christmas*, 1845.
  MRS. WOOD,
                         Bought of JOHN CROSSKEY.

1845.			£	s.	d.
June 10.—70 yds. of calico sheeting	at 9d. per yd.				
—10 pairs of blankets	– 14/ per pair				
Aug. 6.—6 — cotton stockings	– 2/1 —				
—42 yds. Irish sheeting	– 3/ per yd.				
Sept. 8.—6 pairs worsted stockings	– 2/ per pair				
—12 yds. muslin	– 1/6 per yd.				
—18 — ribbon	– 1/4 —				
Oct. 12—10 — French merino	– 8/6 —				
—1 muff	– 25/				
—1 boa	– 21/				
Nov. 15.—1 doz. pairs of kid gloves	– 1/9 per pair				
—20 yds. of blond	– /5 per yd.				
—12 — velvet	– 10/6 —				
			£		

BILLS OF PARCELS.

Exercising Practice or Proportion, and Tare and Tret.

(3)   YORK, *Sept. 5th*, 1845.

   Rev. R. WORSLEY,
                     Bought of PHILIP HUGHES.

cwt. qr. lb.		£ s. d.		£. s. d.
11 1 11	of Zante currants, tare 67 lbs., at........ }	2 18 6	per cwt.	
2 3 14	of Malaga raisins, tare 14 lbs., at .... }	2 12 9	—	
1 0 27	of Turkey ditto, tare 11 lbs., at .... }	2 12 6	—	
3 0 10	of Prunes, tare 14 lbs., at	2 2 10	—	
2 18	of Turkey figs, tare 8 lbs., at .... }	2 13 4	—	
				£

(4)   DUBLIN, *Nov. 3rd*, 1844.

   MR. MURPHY,

                     Bought of JAMES KEOGH.

cwt. qr. lb.		£ s. d.		£. s. d.
3 1 12	gross of lump sugar, tare 14 lbs. pr. cwt. at }	3 16 8	per cwt. neat.	
16 2 14	gross of double refined sugar, tare 8 lbs. per cwt. at.. }	4 19 6	—	
5 1 20	gross of rice, tare 7 lbs. per cwt. at }	1 8 4	—	
1 1 14	gross of pepper, tare 12 lbs. per cwt. at }	5 7 8	—	
				£

(5)   ABERDEEN, *Jan.* 15*th*, 1845.

MR. TATE,

Bought of JOHN FRAIN.

5 bags of cotton, viz.—

	cwt.	qr.	lb.		qr.	lb.		£	s.	d.
No. 1.—	2	1	18	gross.. tare	1	18				
2.—	6	2	27	—	—	1	27			
3.—	3	3	21	—	—	2	5	at £ s. d.		
4—	4	0	17	—	—	0	17	3 16 2		
5.—	7	3	12	—	—	2	3½	per cwt. neat.		

£ _____

(6)   LONDON, *March* 10*th*, 1845.

MR. ROWLAND,

Bought of JAMES BAKER.

	cwt. qr. lb.	£ s. d.	£ s. d.
Tobacco, in leaf, 12 1 19 gross, tare 131 lbs. ....at	5 6 2	pr. cwt. nt.	
Ditto, in rolls.. 6 1 24 gross, tare 36 lbs. ....at	5 18 4	—	
Cotton .... 12 0 18 gross, tare 125½ lbs.......... ..at	3 11 7	—	
Sugar........ 18 1 21 gross, tare 151¼ lbs............at	3 6 4	—	

£ _____

(7)   LIVERPOOL, *June* 2*nd*, 1845.

Mr. BEEBE,

To FREDERICK BOYTON.   *Dr.*

For 5 bags of pepper, viz.—

	cwt. qrs. lb.	lb.	£. s. d.
No. 1.—Wt. gross	2 2 7.. tare	9½	
2.—	— 1 1 19.. —	10¼	at £ s. d.
3.—	— 0 2 5.. —	5½	8 7 6
4.—	— 1 1 7.. —	7¼	per cwt.
5.—	— 1 0 11.. —	7	neat.

£ _____

(8)   MANCHESTER, *Oct.* 26*th*, 1845.

CAPT. MARTIN,

Bought of CHARLES SHUTTLEWORTH.

Four butts of currants, viz.—

£ s. d.

No. 1.—17 cwt. 2 qr. 18 lbs. gross,
tare 18lbs. per cwt., tret 4lbs.
per 104 lbs..............

2.—11 cwt. 1 qr. 12 lbs. gross,
tare 12lbs. per cwt., tret 4 lbs.
per 104 lbs... ....

3.—19 cwt. 1qr. gross, tare 10 lbs.
per cwt., tret 4lbs. per 104lbs.

4.—15 cwt. 3 qr. 19 lbs. gross,
tare in the whole 47 lbs.,
tret 4 lb. per 104 lbs.......

at
£ s.
2 5
per cwt.
neat.

£ _____

(9)   EDINBURGH, *Dec.* 12*th*, 1845.

MR. PIRIE,

Bought of WILLIAM CHAMBERS.

3 casks of madder, as under:

£ s. d.

No. 1.—Wt. gross 18 cwt. 12 lbs.,
tare 16 lbs. per cwt., tret 4 lbs.
per 104 lb., and cloff 2 lbs.
for every 3 cwt. ....

2.—Wt. gross 16 cwt. 1 qr. 8 lbs.,
tare 8lbs. per cwt., tret 4 lbs.
per 104 lbs., and cloff 2 lbs.
for every 3 cwt. ....

3.—Wt. gross 10 cwt., tare 12 lbs.
per cwt., tret 4 lbs. per 104
lbs., and cloff 2 lbs. for every
3 cwt. ....

at
£ s.
3 3
per cwt.
neat.

£ _____

EXERCISING DUODECIMALS, &c.

(10)   BRIGHTON, *Christmas*, 1845.
  Mrs. COURTNEY,

                 Dr. to WILLIAM FIELD.

                                      £   s.   d.

To glazing a window, 7 feet 3 in. high, and 3 feet
    6 in. broad, at 1s. 6d per foot ....

To painting 3 rooms, each 50 ft. round, and 10
    ft. high, the fire-place in each being 5 ft. by
    4 ft., at 5d. per yard··................. .

To whitewashing the ceilings of ditto, each ceil-
    ing being 15 ft. by 10 ft., at 2½d. per yard..

                               £

(11)   CHICHESTER, *June*, 1845.
  MR. CORTIS,

                 To STEPHEN DUNK, *Dr.*

                                       £   s.   d.

To building a brick wall, 150 ft. long and 6 ft.
    8 in. high, 2½ bricks thick, at £5 5s. per rod

To paving a court yard, 35 ft. 9 in. by 24 ft. 3 in.,
    at 6½d. per foot. ....··........

To slating a house with a double roof, each side
    being 45 ft. 6 in. by 18 ft. 9 in., at £2 2s.
    per square........................

                               £

(12)   HULL, *October 10th*, 1845.
  MR. MUNDAY,

             Bought of HIDE AND PATCHING.

                                       £   s.   d.

10 planks of beech, each 10 ft. 9 in. long, and 12
    in. broad, at 2d. per square foot ....

15 fir ditto, each 14 ft. 8 in. long and 15 in.
    broad, at 1d. per square foot ....

840 red Petersburgh deals, at £12 10s. per
    Petersburgh hundred of 120 deals ....

                               £

(13)   BRISTOL, *December*, 1845,

  MR. STUBBS,

                         Dr. to BLAKE AND SON,

                                          £   s.   d.

To flooring 3 rooms, each 18 ft. 10 in. by 14 ft.
    6 in., at £6 12s. 6d. per square ....
To oak graining ditto, being 66 ft. 8 in. round,
    and 9 ft. 6 in. high, the fire-places being
    each 5 ft. by 4 ft. 6 in., at 6d. per square yd.
To 51½ days' work, at 3s. 6d. per day ....
                                          £

INVOICES, ACCOUNTS OF SALES, &c.

(14) Invoice of 18 hhds of tobacco, shipped on board the
" Speculation," Joseph Debell, Master, consigned to Philip
Debell, Merchant in London, for his proper account and
risk, marked as per margin, contents, costs, and charges, viz.

HAVANNA, CUBA, *July 2nd*, 1845.

		£	s.	d.	£	s.	d.
No. 7 to 24 P. D.	To 18 hhds. of the best to-bacco, ..weight 108 cwt. 1 qr. 12 lbs. tare, 1 qr. 12 lbs. per hhd., tret. 4 lbs. per 104 lbs., at 8d. per lb...						
	Charges.						
	For 18 empty hhds.	1	16	0			
	Cooperage, hooping, &c.....	1	7	0			
	Warehouse room	1	2	0			
	Boatage and stowage	0	18	6			
	Charges at shipping	1	3	6			
	For my commission at 3 per cent						
					£		

ROBERT ASHDOWN.

(15) Invoice of 20 boxes of candles, and 12 chests of soap, shipped by me, Thomas Evershed, on board the " Friendship," John Waters, Master, for the proper account and risk of William Potter, Merchant at Boston, marked as per margin, contents, costs, and charges, viz.—

<div align="center">LONDON, September 30th, 1845.</div>

W. P.		£	s.	d.	£	s.	d.
1 to 12	12 boxes, containing 60 dozen lbs. of mould candles, at 8s. 4d. per doz.						
13 to 20	8 boxes, containing 50 doz. dipped ditto, at 5s. 3d. per dozen.............						
	20 boxes at 2s. 6d. each....						
21 to 32	12 chests, containing 8 cwt. of soap, at 50s. per cwt.						
.	12 chests at 2s. each						
	Charges.						
	Cartage, lighterage, and wharfage	1	17	6			
	Entry bond, shipping charges, and bills of lading	2	12	9			
	To my commission, at 2½ per cent						
					£		

<div align="center">THOMAS EVERSHED.</div>

(16) Invoice of sundry goods, shipped by Spillman Brothers, in the " Bristol," Chasemore Howard, from London to Jamaica, on account and risk of Messrs. Chaplin and Co., of Kingston, marked as per margin ; contents, costs, charges, viz.—

LONDON, *August 10th*, 1845.

		£	s.	d.	£	s.	d.
C K̄ 1 to 10	10 bales of Wigan calicoes, chintzes, Coleraine Irish, per Hannington and Co's bill				360		
11 to 12	2 cases of books, per Longman and Co's bill				47	10	
13 to 18	6 cases of hats, per Hutton's bill				135	15	
19 to 20	2 cases of stationery, per Relfe and Co's bill				48	12	
	Charges.						
	Entry duty on part, at ¼ per cent	2	5	0			
	Bond and debenture	0	7	6			
	Freight and primage	26	0	0			
	Bills of lading	0	4	6			
	Commission, 5 per cent.						
	Insurance on £700, at 2 guineas per cent						
	Policy duty	2	12	6			
	Commission, ½ per cent. on £700 insured						
					£		

Errors excepted.

SPILLMAN BROTHERS.

(17) Invoice of 3 trunks of cotton hosiery, forwarded to Messrs. Boyton & Co., Merchants, Liverpool, to be shipped on our account and risk to Mr. Wm. McGeorge, Merchant, New York, marked as per margin.

NOTTINGHAM, *Oct.* 2*nd*, 1845.

W. M. N. Y. No. 1.		£	s.	d.	£	s.	d.
	10 doz. of women's white cotton hose at 18s. per doz.						
	6 doz. do. at 24s. — ..						
	12 doz. do. at 32s. — ..						
	Trunk	1	1	0			
No. 2.	8 doz. white ribbed cotton hose .... at 30s.						
	6 do. .... at 28s.						
	10 do............. at 36s.						
	6 do. plain white .. at 24s.						
	2 do. — .. at 26s.						
	Trunk	0	18	6			
No. 3.	18 doz. men's fancy cotton hose .... at 36s.						
	12 do. .... at 40s.						
	10 do. patent fancy .. at 42s.						
	Trunk...............	1	5	0			
	Messrs. Boyton & Co.'s charges of shipping and insurance	8	7	6			
	£						

STEPHEN DARBY & Co.

(18) Accounts of sales of 15 pipes of linseed oil, received per the "Bee's Wing," James Lean, and sold for account of John Solomon & Co. London.

			Dollars.
Sold at 4 months.			
15 pipes, 2000 galls. at 100 cents. per gall.........			
Charges.			
	Dollars.		
Freight £18 4s 6d at 4s 6d per dollar............			
Duty on 2000 galls. at 20 dollars per cent.			
Bond, permit, &c.	5	50	
Cartage and porterage	18	50	
Gauging	6	25	
Cooperage, hoops, &c......	10	75	
Rent...................	12	50	
Fire insurance...........	3	0	
Brokerage, 50 cents. per pipe			
Commission, 5 per cent.....			
Nett proceeds, due February 1st. 1845 .... } Dollars.			

JOHN STRANGER.

PHILADELPHIA, *Oct. 1st,* 1845.

(19) Account of sales of 10 tierces of coffee, received by the "Hope," on account of Messrs. Edmunds and Co., Demerara.

	Gross wt.	Tare	
	cwt. qr. lb.	cwt. qr. lb.	
J. C. 5 tierces	32 1 20	3 0 18	
1 to 10	3 —	24 3 12	
	2 —	18 0 14	

Tret 4 lbs. per 104 lbs. at 6 guineas per cwt. neat

Gross proceeds... £

Charges.	£ s. d.	£ s. d.
Insurance on 10 tierces at £50 a tierce, at 3 guineas per cent.		
Policy of insurance............	1 10 6	
Freight on, at 6s 6d per cwt..		
Dock dues	6 7 0	
Landwaiters, entry, and part of bond............		
Insurance from fire	0 17 3	
Brokerage, 1 per cent.........	0 18 0	
Commission, 2½ per cent......		
Commission, ½ per cent., on £500 insured		

Nett proceeds due Dec. 3, 1845

London, Oct. 3rd, 1845.

Errors excepted.

JAMES CORFE.

RECEIPTS, PROMISSORY NOTES, BILLS OF EXCHANGE, &c.

RECEIPTS.

(20)   LONDON, *Oct. 7th*, 1845.

Received of Messrs. Whittaker and Co. the sum of eighteen pounds, in full of all demands.

£18   FRANK SMITH.

(21) Received, December 30th, 1845, of Mr. Thomas Keith, the sum of thirty-five pounds, for half-a-year's rent, due on Christmas-day last.

£35   SAMUEL MAYNARD.

(22) Received, July 21st, 1845, of Mr. William Harvey, the sum of twenty-five pounds fourteen shillings, in part payment of sixty pounds, due to me from the said William Harvey.

£25 14s. 0d.   CHARLES EDE.

(23) Received, November 28th, 1845, of William Harris, Esq., and the owners of the ship "Resource," the sum of ninety-two pounds, in full, for cordage, tackle, and trimming, furnished to the said ship.

£92   ARTHUR MORRAH.

PROMISSORY NOTES.

(24) I promise to pay to Mr. John Agate, or order, the sum of forty-five pounds, on demand, for value received. Witness my hand this fifth day of November, 1845.

£45   HENRY GOLDSMITH.

(25)   SOUTHAMPTON, *Oct.* 26*th*, 1845.

Two months after date, I promise to pay to Mr. James Woodford, the sum of one hundred pounds, for value received by me.

£100   RICHARD CLAYTON.   ,

INLAND BILLS OF EXCHANGE.

(26)   GLASGOW, *May* 10*th*, 1845.

Sir,—Pay Mr. George Willis, or bearer, eighty pounds, and place it to my account.

                    WILLIAM McLEAN.
To Mr. Campbell, Merchant, Edinburgh.

(27)   NEWCASTLE, *June* 5*th*, 1845.

At sight, pay Mr. Charles Lamb the sum of fifty pounds, for value received of Mr. Henry Croft, and place it to account, as per advice from

                    THOMAS SUREPAY.
To Mr. Thomas Moon, Grocer, Strand, London.

(28)   HULL, *Sept.* 21*st*, 1845.

Two months after sight, pay to Sir Horace Walpole, or order, three hundred pounds, value received of the Right Hon. the Countess of Beauchamp, and place it to account, as per advice from

                    CHARLES DICKENS.
To Sir Thomas Thwaytes, Merchant, London.

      Accepted, Sept. 24*th*, THOMAS THWAYTES.

FOREIGN BILLS OF EXCHANGE.

(29)   For 480 dollars, at 55¼d. per dollar.

LONDON, *Feb. 20th*, 1845.

At usance, pay this my first bill of exchange to William Pitt, Esq., or order, four hundred and eighty dollars, at 55¼d. per dollar, value received, and place it to the account of

Your humble servant,
CHARLES FOX.

Mr. Charles Roberts, Merchant, Cadiz.

Ques.—What is the value of this bill in sterling money ?

(30)   For 460 crowns, at 56½d. sterling per crown ?

LIVERPOOL, *April 15th*, 1845.

At usance, pay this my third bill of exchange, my first and second not paid, to Charles Buller, Esq., or order, four hundred and sixty crowns, at fifty-six pence half-penny per crown, for value received of John Bolitha, Esq., as per advice from

Your humble servant,
HARRIS NICOLAS.

To Monsieur Laplace, Merchant, Bordeaux.

Ques.—What is the value of this bill in sterling money ?

G

(31) For £781 10s. sterling, at 34s. 6d. Flemish per £. sterling, at usance.

LONDON, *June 5th*, 1845.

At usance, pay this my first bill of exchange to Stephen Vanderhoff, or order, seven hundred and eighty-one pounds ten shillings sterling, at thirty-four shillings and sixpence Flemish per £. sterling, value received of Edward Henty, Esq., and place it to account, as per advice from

Your humble servant,

CHARLES KEAN.

To Mr. Van Dunk, Merchant, Amsterdam.

Ques.—What is the value of this bill in Flemish money?

(32) For 8761 guild. 18 stiv. at 34s. 4d. per £. sterling, at usance.

AMSTERDAM, *July 21st*, 1845.

At usance, pay this my second bill of exchange, my first not paid, to George Canning, or order, eight thousand seven hundred and sixty-one guilders eighteen stivers, at thirty-four shillings and fourpence Flemish per £. sterling, value received of Philip De Witt, and place it to account, as per advice from

Your humble servant,

JACOB VANDALE.

To Wm. Stamper, Esq., Merchant, London.

Ques.—What is the value of this bill in sterling money?

(33)   For 2000 crowns, at 4s. 6d.

PARIS, *August 9th*, 1845.

At one month after sight, pay this my first bill of exchange to John Plumer, or order, the sum of two thousand crowns, at four shillings and sixpence each, value received, and place it to account, as per advice of,

Your humble servant,

HENRI SOULT.

To Wm. Hale, Esq., Merchant, in London.

Accepted, Sept. 3rd, WM. HALE.

Ques.—What is the value of this bill in sterling money ?

(34)   For £879 12s. sterling, at 54½d. per ducat bank,
at usance.

LONDON, *March 20th*, 1845

At usance, pay this my third bill of exchange, my first and second not paid, to Mr. George Downer, or order, eight hundred and seventy-nine pounds twelve shillings sterling, in ducats, at fifty-four pence half-penny each, and place it to the account of   Your humble servant,

THOMAS WEEDON.

To Signor Goldoni, Merchant, at Venice.

Ques.—What is the value of this bill in ducats bank ?

LETTERS OF CREDIT.

(35)   LONDON, *October 4th*, 1845.

Gentlemen,—Please to furnish the bearer hereof, Mr. Douglas Percival, with what money he may require, to any amount not exceeding one thousand pounds, and place it to my account, for which this letter of credit, and his receipt, shall be your sufficient warrant; giving upon payment a line of advice to   Your's,

BENJAMIN FIELD.

To Messrs. King & Co., Merchants, at Liverpool.

(36)   LONDON, *Oct. 8th*, 1845.

Sir,—The bearer, Mr. Henry Ratcliffe, will have occasion for five hundred pounds, with which sum please to furnish him, and take his bill for the said sum, or any part thereof, on John Morrison, of Manchester.
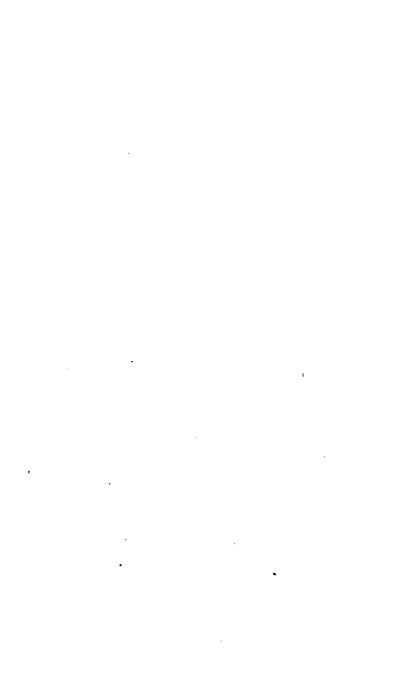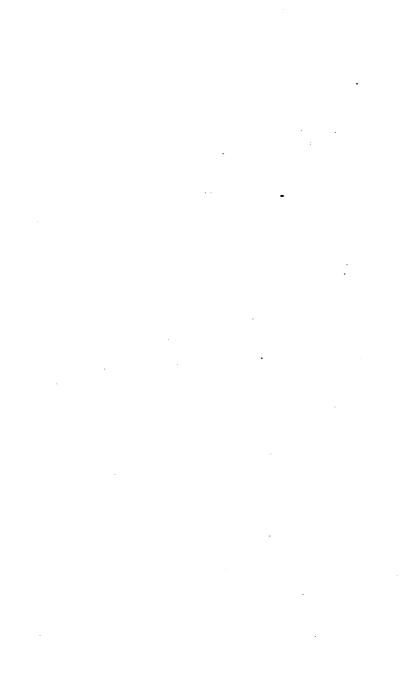
Your humble servant,

WILLIAM LANE.

To John Fraser, Esq., Bristol.

* A Key to this work, containing the answers and the solutions, at full length, wherever there is the least appearance of difficulty, may be had of the same Publishers.